CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Friday, January 7, 2005
10:00 a.m. - 4:00 p.m.

Elihu Harris State Office Building
Room
1515 Clay Street
Oakland, California

Members of the public are invited to attend or view or listen to the meeting via Internet webcasting. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

1. *To Review the Science Team charge and discuss roles and responsibilities*
2. *To make recommendations on criteria for selecting the Central Coast Pilot Project area*
3. *To comment on the Draft Master Plan Framework table of contents*
4. *To Review the Draft requirements for MPA network proposals*
5. *To discuss existing contracts for scientific information gathering and needs for long-term research*
6. *To schedule of future meetings* ***(Please bring your schedules!)***

1. Introduction and Welcome 10:00 a.m.
Patricia Wolf, Marine Region Manager, California Department of Fish and Game
John Kirlin, Executive Director, MLPA Initiative Blue Ribbon Task Force

2. Charge to the Science Team - Operating Procedures
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG
Mike Weber, Senior Project Manager, MLPA Initiative

3. Criteria for Selecting the Central Coast Project Area
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG
A. Review of draft criteria
B. Sources of scientific data to choose a project area
C. Additional criteria from the team

Lunch - Please be prepared to purchase lunch at nearby restaurants

4. Draft Master Plan Framework Table of Contents
Mike Weber, Senior Project Manager, MLPA Initiative
A. Overview of TOC
B. Potential areas of scientific input and data needs

5. Public Comment
Comment will be limited to time available at the discretion of the Science Team Chair.

6. Draft Requirements for MPA Network Proposals
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG
A. Brief overview of Draft Requirements
B. Comments from the Team, or defer comments to later date

7. Short-term research contracts and long-term needs
Mike Weber, Senior Project Manager, MLPA Initiative
A. Overview of current contracts
B. Brief discussion of future contract needs

8. Wrap up and Schedule of Future Meetings

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
Meeting Summary
January 7, 2005
Elihu Harris State Building
1515 Clay Street, Room 11
Oakland, California

Science Team members present: Loo Botsford, Mark Carr, Steve Gaines, Doyle Hanan, Rikk Kvitek, Steve Murray, Mark Ohman, Jeff Paduan, Linwood Pendleton, Steve Ralston, Laura Rogers-Bennett, Dave Schaub, Astrid Scholz, Rick Starr, William Sydeman, Dean Wendt, Mary Yoklavich.

Not present: Kenneth Schiff

Others present: Science Team Chair Steve Barrager and approximately 15 members of the public.

DFG staff: Dave Parker, Paul Reilly, John Ugoretz, Patty Wolf

MLPA Initiative Staff: John Kirlin, Mike Weber

Introduction and Welcome

Patty Wolf, DFG Marine Region manager, made introductory remarks. The MLPA Initiative has the support of DFG's director, the Resources Agency's secretary, and the Governor. The initiative has an ambitious timetable and its credibility rests heavily on readily available science. Patty briefly explained the charge to the Science Team (Team).

Patty announced three recent appointments: Dr. Steve Barrager is the Science Team Chair and not an official member of the Team. Dr. Steve Ralston, National Marine Fisheries Service, has been added to the Team. Dr. Laura Rogers-Bennett, DFG Senior Biologist Specialist, has been added to the Team as the department's MLPA Technical Advisor.

John Kirlin, MLPA Initiative executive director, explained his role of keeping the process on track and acting as the primary link to the Blue Ribbon Task Force (BRTF). He then asked the Team members to briefly introduce themselves and state their area of expertise.

Charge to the Science Team – Operating Procedures

John Ugoretz, DFG's MLPA and nearshore ecosystem coordinator, stated that Laura Rogers-Bennett will be DFG's primary representative at future Team meetings. John read the charge to the Team from their charter (available on the MLPA web site). Team meetings will be more frequent than bi-monthly in the beginning, will be open to the

public, and will be video-taped. Each meeting will have at least one formal public comment period.

The Team will not write the draft master plan framework, but will review and comment on the document. The Team is empowered by DFG's director until 2006. A science subteam will work with the central coast project's regional stakeholder group. A member of the subteam will attend all regional group meetings.

Mike Weber, MLPA Initiative senior project manager, explained the proposed time table for the draft Master Plan Framework: first draft completed by mid-February, then comments from the public, BRTF, and Science Team; next draft completed by late March and presented to the BRTF at its April meeting.

Mike stated the Team still needs another fishery economist; several candidates have been suggested. The Team also is required to have a representative of the State Water Resources Control Board - this position is currently vacant.

In response to questions from the Team, staff explained that the draft annotated table of contents for the Master Plan Framework came primarily from the language of the MLPA and also from the first two rounds of the MLPA process from 2000 until 2003. Staff explained that the BRTF received a document summarizing other related state and federal MPA processes in California, which we will make available to the Team.

The Team asked and discussed how do we define and measure success in relation to the MLPA Initiative and process.

Criteria for Selecting the Central Coast Project Area

A two-page draft document (available on the MLPA web site) was posted on screen and reviewed by Mike Weber. John Ugoretz explained that what is considered to be the greater central coast area (Pt. Arena to Pt. Conception) will not be considered as the central coast project area as it is too large. The Team commented that all of the criteria listed pertain to human use. What is lacking is a habitat-based criterion which reflects natural boundaries. There are biogeographic breaks along the central coast. Along the entire state coast are fairly regularly-spaced capes or headlands which produce repetitive zones (upwelling and convergence); these should be considered when proposing project area boundaries. After caucusing during lunch, several Team members proposed that that the area from Pt. Conception to the Golden Gate or Pt. Reyes, with a partition at Pt. Sur, be considered as boundary options for the central coast project.

It was also suggested that the project area consider the diversity and intensity of human activities, such as recreational and commercial fishing, and non-consumptive scuba diving.

Not only are there *scales of repetition* that we need to consider but we must also include *scales of diversity* in network designs. Multiple areas with the same sandy bottom will not satisfy the criteria for a network.

Government activities should also be considered. For example, the greater central coast contains three national marine sanctuaries, two of which have ongoing stakeholder working groups dealing with MPAs and fishery issues.

The project area needs to be large enough to contain a network of MPAs, although staff clarifies that the project area will be developing recommendations for MPAs which ultimately will fit into a statewide network. The question was asked of how big does an area have to be to design a network. The Team offered that it depends on the species and could be from 2 to 1000 kilometers, but that several hundred kilometers was reasonable. The project area should be large enough to contain replicate MPAs with similar objectives to allow evaluation of the network aspect.

Staff remarked that the previous MLPA process had three stakeholder working groups within the greater central coast, and this approach considered practical aspects such as the geographical extent of individual knowledge about marine habitats and species. The Team commented that the last two draft criteria (distance working group members would need to travel and availability of DFG staff) were superfluous and not biological. Staff replied that practical aspects of convening meetings and staff availability must be considered. The Team commented that video-conferencing could mitigate for some of the potential difficulties due to excessive travel.

A public comment period followed. Summaries of comments germane to the central coast project criteria are as follows:

- Consider boundary lines established by federal fishery regulations.
- Support for the use of biophysical barriers as boundaries.
- Area must be large enough to provide for replication.
- Width of continental shelf varies with greater central coast; important to provide for a variety of shelf widths.
- Include area with high intensity of non-consumptive use (scuba) - Monterey Peninsula.
- Consider the existence of currents MPAs.
- A split at the Golden Gate will divide important fisheries and delay process due to need to revisit same fisheries twice.
- Consider presence of three existing national marine sanctuaries. The sanctuaries have a data base from Diablo Canyon to Gualala.

Further discussion on boundary options included occurrence of species. For example, the Monterey Bay has many borders for species' ranges but not for the dominant species. On either side of the Golden Gate Bridge are changes in abundance of dominant species. The

Team commented that Año Nuevo (the point used to define the boundary of two working groups in the previous MLPA process) has no definitive species breaks.

Staff then summarized suggestions by the Team on additional proposed central coast project criteria:

- Use major physical/geographic boundaries.
- Have area of sufficient size to include replicates.
- Have area of sufficient size to include high diversity and intensity of uses.
- Include at least part of an area that has maximum habitat information (Monterey Bay south to Pt. Conception).

The following items need to be accomplished relative to the central coast project area:

- Monitor MPAs which are adopted, as well as areas outside the MPAs, before, during, and after implementation.
- Social and economic studies are critical.
- An inventory of the available data for the central coast should be conducted and the data should be made available to all.
- Goals need to be defined.
- Funding options for research need to be explored.
- The list of species likely to benefit from MPAs needs to be re-visited.

Draft Master Plan Framework Table of Contents

The purpose of the framework is to provide guidance on the design and evaluation of MPA networks on a regional basis. These regional networks ultimately will comprise the statewide network. Staff will draft the language of the framework and will provide this to the Team, BRTF, and public for comments in an iterative process. Short-term contracts are underway, primarily in the form of literature surveys, to provide substance to the framework. Pieces of the draft framework will be circulated as they are ready, and additional workshops may be convened to obtain more information and comment. The goal is for the Fish and Game Commission to adopt the framework at their August 2005 meeting.

The framework will not include a legal interpretation of the MLPA. It will be a recommendation to the Fish and Game Commission, providing options where appropriate and guidance. It will be an adaptive document. There will be a range of minimum size criteria for individual MPAs and criteria explaining how to determined size for proposed MPAs. Staff then briefly reviewed the sections of the annotated table of contents (available on the MLPA web site). The evaluation of existing MPAs (Section IIIv) will occur on a regional basis only.

The Team was then asked the following questions for their long-term consideration:

- Which elements of the draft framework need urgent attention and least attention?
- How might available literature be applied?

- What kinds of information should be assembled?

Staff commented that some of the terms in the framework (e.g. definitions of three types of MPAs) have clearly defined state definitions. The biggest question is how to define the term "network."

The Team asked if they should be helping on contract work. Staff responded that the Team has the option of reviewing any drafts prepared by staff and contractors.

Team comments:

- Biggest gaps in framework relate to socio-economic studies.
- The socio-economic landscape needs to be determined before MPAs are proposed.
- The alternative network proposal outline made it appear that socioeconomic analysis would be conducted only after, not during, the development of MPA network proposals, and that such analysis should be part of the process of developing network proposals.
- Since MPA site replication by region is mandated by the MLPA, having more regions will result in more MPAs.
- The previous MLPA process used four regions; these were based primarily on habitat rather than species.

Draft Requirements for MPA Proposals

Staff briefly referred to the contents of this document (available on the MLPA web site) and stated that the are not looking for input today. There is another method for the public to propose MPAs outside this process, but DFG staff cannot contribute time and expertise and the Fish and Game Commission likely will not consider proposals for individual MPAs outside this process.

Staff further stated that the framework will not need a CEQA analysis but that the regional MPA network proposals will go through CEQA analysis during the regulatory process.

Short-Term Research Contracts and Long-Term Needs

Staff reviewed ongoing contract work, all of which involves literature surveys on the following topics:

- First element: Design, evaluation, and phasing of marine reserves, marine parks, marine conservation areas, and MPA networks.
- Second element: Key definitions, in literature, statutes, and regulations.
- Third element: Funding of MPA networks.
- Fourth element: Management of MPA networks.
- Fifth element: Implementation of MPA regulations.

Drafts of this short-term contract work should be available by the end of January.

Additional contract work planned:

- Update of DFG list of species likely to benefit from MPAs.
- Review of process for establishing list of species likely to benefit.
- Approaches to monitoring, research, and evaluation.
- Relative efficacy of MPAs and traditional fishery management tools.
- Impact of MPAs on existing regulatory programs.

(The latter two tasks were requested by the BRTF).

Staff added that possible workshops may be planned to discuss ocean mapping, socio-economics (a continuation of the 2002 workshop in Santa Cruz), and decision-making tools.

The Team requested a list of key research areas so they can make contractors aware of new studies in press. The Team commented that the contribution of MPAs to the sustainability of marine populations, and vice-verse, need to be considered. The Team stated that there are now federal working groups dealing with the integration of MPAs and fishery management and they are on a 2-3 year time frame. The Team stated that an important question to ask relative to the efficacy of MPAs is what causes variability in natural populations.

Team member Kvitek showed an example of high-resolution bathymetry and stated that he can direct future mapping efforts within the central coast project area. He has two more years of funding for mapping from the National Marine Sanctuary Program and additional funds from the CICOR program. He can obtain more habitat data locally once the central coast project area is determined. By June 2005 he will have high-resolution habitat maps from Monterey Bay to Pt. Sur out to 1.5 miles, plus the Farallon Islands and San Francisco areas. The deeper maps done by the U.S. Geological Survey in central California are on a coarse scale and can be considered as "habitat-potential" maps.

As an exercise, Chair Barrager then asked each Team member for a short response to the question, "How could this group fail?" The following summarizes the responses:

- Goal was consensus but we did not achieve it.
- Draft framework not produced by May 2005.
- Concerns of larger community were ignored.
- Overall goal was not kept in picture.
- It was not recognized that these are contentious processes.
- Goals of the MLPA were not met.
- Essential data were not collected.
- Measures for determining efficacy of MPAs were not developed.
- Only convenient habitats were protected.
- Advice was not provided that resulted in sustainability.
- What happened at the end did not depend on science.

- What MPAs are, or are not doing, were not quantitatively evaluated.
- We are politicized as having our own agenda.
- We cannot put aside individual differences of opinion.
- We do too much policy.
- We try to interpret legislation.
- We ask the wrong questions.
- The science we recommend is ignored because it is weak and confusing.
- We do not evaluate the guidelines later, relative to achieving goals.
- The process gets derailed due to politics after the group develops a good plan.
- We do not appreciate each others' perspectives.
- We are not articulate enough to make a difference.
- We have no plan to make the system accountable.
- We have an advocacy position for what is really policy.
- There was failure to act on the guidance of the Science Team.
- The Team ignores the history of the process.
- Expertise is not used effectively.
- Scientists are not clear as to what is desired from them.

A short public comment period ensued. One comment pleaded to the Team not to ignore local knowledge about species and habitats from local users.

The next two Science Team meetings were scheduled in Oakland at the Eliju Harris Building from 10:00 a.m. to 4:00 p.m. on Friday February 11, 2005 and Wednesday March 23, 2005.

The meeting was adjourned.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Friday, February 11, 2005
10:00 a.m. - 4:30 p.m.

Elihu Harris State Office Building
1515 Clay Street, Room 2
Oakland, California

This meeting will be videotaped for future viewing on the internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

1. *To review the roles and responsibilities of the Science Advisory Team*
2. *To comment on the draft design and evaluation of MPA networks section of the draft Master Plan Framework*
3. *To review application of the adopted criteria to potential central coast study regions*
4. *To discuss the monitoring and evaluation of MPAs section of the draft Master Plan Framework (if there is time)*
5. *To schedule future meetings* ***(Please bring your schedules!)***

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1. Introduction and Update 10:00 a.m.
Steve Barrager, Chair, Science Advisory Team
Mike Weber, Senior Project Manager, MLPA Initiative
A. General framework for thinking about marine resource decisions - Steve
B. Update on the MLPA Initiative – Mike

2. Goals and Objectives of the MLPA Initiative and Role of the Science Advisory Team
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG
A. Review of goals
B. Role of Science Advisory Team

3. Review of Draft Master Plan Framework: Design and Evaluation of MPA Networks
Mike Weber, Senior Project Manager, MLPA Initiative

Lunch - please be prepared to purchase lunch at a nearby restaurant

4. Recommendations for the Central Coast Study Region
John Ugoretz
A. Review of criteria adopted by the Blue Ribbon Task Force
B. Sources of scientific data for selecting a study region
C. Recommendations from the science team to the Blue Ribbon Task Force

5. Draft Master Plan Framework: Monitoring and Evaluation of MPAs (possibly deferred to March meeting)
Mike Weber

A. Overview of monitoring and evaluation of MPAs section
B. Potential areas of scientific input and data needs
C. Potential additions and deletions

6. Team Challenges
Steve Barrager

7. Wrap up, Schedule of Future Meetings and Public Comment
Public comment will be limited to time available at the discretion of the chair.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
Meeting Summary
February 11, 2005
Elihu Harris State Building
1515 Clay Street, Room 2
Oakland, California

Science Team members present: Mark Carr, Steve Gaines, Doyle Hanan, Rikk Kvitek, Steven Murray, Mark Ohman, Jeff Paduan, Steven Palumbi, Linwood Pendleton, Laura Rogers-Bennett, Kenneth Schiff, Astrid Scholz, Rick Starr, William Sydeman, Dean Wendt, Mary Yoklavich

Not present: Loo Botsford

Others present: Science Team Chair Stephen Barrager, notetaker Carrie Kappel, and approximately 15 members of the public

DFG staff: John Ugoretz

MLPA Initiative Staff: John Kirlin, Mike Weber

Introduction

Science Team Chair Steve Barrager welcomed the group and set the stage for the day's discussions with some comments on decision-making based on decision theory and his experience. Steve emphasized that judging the merit of any decision is difficult, but that decision quality has six elements:

1. The appropriateness of the framing of the situation.
2. The creativity and do-ability of proposed alternatives.
3. The meaningfulness and reliability of information used.
4. The clarity of values and trade-offs.
5. The logical correctness of the reasoning used.
6. The commitment to action.

Steve suggested that the science team give some thought to the reasons why preceding efforts may have been less successful and how these relate to the six elements. Since we are in the early stages of decision-making, Steve put special emphasis on the importance of appropriate framing.

Steve went on to talk about the difficulties of confronting decisions that have both high analytical and high organizational complexity. The design of marine protected area networks is definitely in this category. He suggested that three norms are important when working in this realm:

1. Use a good, straightforward decision process.
2. Involve the right people in a decision dialogue.

3. Use appropriate tools to improve communication, creativity, and analysis.

Steve went on to explain what such a decision process might entail and some of the tools that might be applied.

Goals and Objectives of the MLPA Initiative

John Ugoretz, DFG's MLPA and nearshore ecosystem coordinator, reviewed the goals and objectives of the MLPA from the language of the act and addressed the role of the science team. John stated that MLPA requires that a master plan team be convened to advise and assist the department in preparing the master plan. The current Master Plan Science Advisory Team is an expansion of the team required in the act. For example, more economists and sociologists have been added; social scientists were not required specifically under MLPA. John explained that the act requires that decisions be based on "sound scientific guidelines" and the "best readily available" and "up to date" science. Specific roles for the science team that John outlined include:

- Providing input, editorial comments, and advice on draft documents.
- Recommending additional information needed to make sound decisions.
- Working as sub-teams to synthesize available science into user-friendly formats to help DFG put this information into documents.
- Helping to draft portions of the master plan framework and/or central coast proposal of MPA alternatives for a network component.
- Responding to scientific issues raised by the task force and central coast stakeholder group.

Team members asked and discussed how they can provide input into the creation of scientific criteria for decision-making and the generation of alternatives, and then later in the process, turn around and objectively evaluate the alternatives.

John noted that names of volunteers for the Central Coast Science Sub-Team would be taken during this meeting.

In response to questions from the team, John explained that a draft review of existing MPAs in California waters and research done on or in those MPAs has been undertaken and is available on the MLPA Initiative website.

Team members also inquired about language in Goal 6 of MLPA, which requires that MPAs be designed and managed *to the extent possible* as a network. John stated that this language did suggest that there must be a statewide network, but that this did not necessarily mean that there must be new MPAs in all regions. He also offered to ask DFG staff for further clarification on what is meant by "to the extent possible" within a policy context.

Team members and John discussed the intersection between the goals and objectives of MLPA and of fisheries management in general, and the need for a cost-benefit analysis of the

various management alternatives for meeting goals of the act. John made it clear that the MLPA master plan and Marine Life Protection Program would not result in changes in fisheries management beyond MPAs, but that the team could make recommendations about such if they felt them to be important. Mary Yoklavich and Loo Botsford were identified as potential links to a parallel federal planning process for reserve design on the West Coast under the Pacific Fishery Management Council. John also urged team members to help the public understand the differences between and among MPA and fisheries management measures.

John Kirlin encouraged the team to frame the issues around the tools available to them via the act, namely spatial management via MPAs.

The team discussed roles of MPAs, emphasizing that contributing to overall network function could be the role of an individual MPA.

In response to questions, John Ugoretz outlined the process by which the team will communicate with and advise the Blue Ribbon Task Force. The team will review and comment on prepared documents, which will then be revised by DFG and MLPA Initiative staff based on the team's comments and those of the public. The documents, once finalized by the task force, will go to DFG for it's review and potential revision and then, from there, to the Fish and Game Commission for action. There may also be opportunities for direct input to the task force or input via Steve Barrager to the task force, and opportunities for input into the Fish and Game Commission process. The commission may seek the advice of the team in evaluating options.

The team discussed the need for socioeconomic and/or cultural objectives in the guidelines for MPA design. Team members also discussed whether new data would be collected to fill gaps identified during the review of existing MPAs and existing data. John stated that MLPA does not require collection of new data, but to the extent possible, important new data and existing data will be collected and compiled.

Draft Master Plan Framework: Design and Evaluation of MPA Networks

Mike Weber led a discussion of the draft guidelines for design and evaluation of MPA networks given in the Preliminary Draft Master Plan Framework (available on the MLPA website). This framework is intended to facilitate logical step-by-step implementation of the MLPA by providing guidelines for decision-making. He reported that the entire draft will be available shortly and open for comment until March 1. The revised document will be returned to the team on March 14th or 15th and discussion will continue at the March 23rd meeting. The document will then be revised again into the final draft, which will be presented to the task force at the April 11-12 meeting, after which it goes on to DFG and the commission.

The group discussed the focus of the framework document. Mike emphasized that it is to be general and process-oriented. More specific guidelines for interpretation and application of the MLPA's goals and objectives will be undertaken by the central coast sub-team. Their guidance will then be attached to the framework as an appendix and will be used to revise later versions of the framework and other regional plans.

Team members asked about the timeline for planning and implementation and the scope of the framework. Mike responded that the framework will apply to the whole state, with implementation proceeding regionally, starting with an area along the central coast and resulting in a statewide network by 2011. This will allow other regions to learn from the central coast process.

The team discussed the definition of habitats used in the framework. The importance of ocean climates, (the water column component of habitat), freshwater input, spatial scales of heterogeneity, and habitat quality was discussed. The need to define both unique and representative habitat types was brought up. A sub-team composed of Mark Ohman, Jeff Paduan, and William Sydeman, with Steve Gaines as chair, was designated to tackle the question of how to define habitats.

The team discussed the need for reference sites – sites open to fishing which serve as controls for comparison and evaluation of the effectiveness of MPAs – which should be picked just as carefully as the MPA sites, matching scales of spatial heterogeneity, for example.

The team brought up the need for a common geographic information system (GIS) framework for collecting, analyzing and presenting all the biophysical and socioeconomic data the team and task force will use. John Ugoretz described the DFG resources available for this, including staff time through the University of California, Santa Barbara, an ARCIMS server that could host the data and make it publicly available, and a GIS technician to be associated with the MLPA Initiative. Rikk Kvitek was nominated to be the team's liaison to DFG GIS staff and resources. The team also discussed how these efforts will coordinate with other spatial data collection efforts such as Environmental Defense's OceanMap. John and Rikk will report back at the next meeting regarding plans for GIS support and data coordination, storage and access. Astrid Scholz offered support from Ecotrust as well for these efforts.

The team talked about other data sources that should be incorporated, including socioeconomic data and data on unique or critical habitats. The importance of reviewing and controlling the quality of input data and prioritizing among available datasets was also discussed.

Another sub-team was created to work on data issues, e.g. what data are needed, which are available, how can data quality be evaluated and data acquisition prioritized, and how may those data be applied? Rikk Kvitek as chair, with Laura Rogers-Bennett, Astrid Scholz, and Steve Gaines will make up this sub-team. The team plans to review the final list of data layers to add caveats about data quality and how layers might be applied.

The team considered a number of more specific issues related to network design, including:

- issues of MPA size and spacing;
- focal species approaches versus other approaches;
- approaches to designing MPAs other than "no-take" reserves;

- definitions of terms used to describe habitats, e.g. extent, quality, etc.; and
- the need for common terms that can be applied to both biophysical and socioeconomic data.

Steve Palumbi as chair, with Astrid Scholz, Mark Carr, Steve Gaines, and Rick Starr formed a design criteria for MPA networks sub-team and offered to draft a set of scientific design criteria for MPA networks based on the best available biophysical and socioeconomic science. They will address issues such as how spatial scales of individual movements of focal species and of larval dispersal should guide decisions about MPA size and spacing.

The team discussed the need for objectivity in their later role in advising the task force in the evaluation of alternatives. Members emphasized the importance of providing clear criteria and guidelines early in the process so that goals for design are well-framed, regional groups can be more effective, and the science team can retain objectivity in the final evaluation.

Timeline for the MLPA Initiative

John Kirlin, MLPA Initiative executive director, distributed a milestones timeline for the MLPA Initiative. The following is a summary of important milestones in the process:

- February 22, 2005 (Note, this decision has been deferred to the April 11 task force meeting) – Selection of central coast study region; public comments in Bodega, Santa Cruz and Morro Bay, February 15, 16, 17.
- Late February or early March 2005 (This process will now begin after April 11) – Start of central coast regional planning process.
- April 2005 – master plan framework (MPF) approval by task force, submission to DFG
- August 2005 – Commission's first opportunity to act on MPF, following public comment; science team may be asked to provide comment.
- December 2005 – Development of long-term strategies for financing, management and enforcement.
- March 2006 – Central coast network component submission to Fish and Game Commission.
- June or July 2006 – Following public comment, commission may act on central coast network component.
- November 2006 – Development of recommendations for coordination with federal government.
- December 2006 – Agreement among state agencies to complete MLPA implementation by 2011.
- 2007 through 2011 – Implementation of other regional network components in a phased approach.

In response to questions from team members, John clarified that central coast study region planning will begin immediately following selection of the study region and will not have to wait for commission approval of the MPF, though any changes made to the MPF will have to be incorporated into the regional planning process.

Recommendations for the Central Coast Study Region

John Ugoretz presented the criteria for selection of the central coast study region, which the task force revised based on comments of the science team, the public, and previous MLPA working groups, and information about DFG nearshore fishery management areas. The draft document is available on the MLPA website. The criteria are listed below:

- Biophysical boundaries
- Area big enough for replicates?
- Relative amount of habitat mapped
- Human activity boundaries
- Progress of past MLPA and other public discussion groups
- Scientific knowledge of, and research being conducted in, the region
- Availability of firsthand knowledge of the area
- Number of existing MPAs
- Availability of scientific data about existing MPAs and how they meet or do not meet both resource protection needs and the requirements of the MLPA
- Existing fishery regulations in the region and how they meet or do not meet both resource protection needs and the requirements of the MLPA
- Number of complete DFG fishing districts and management areas (related to existing fishery regulations)
- Range or area over which resources are utilized by user groups
- Range or area over which a resource user may be expected to have a working knowledge of the resources
- Distance members of a regional stakeholder group would need to travel in order to participate in group meetings.
- Availability of DFG personnel

John also presented the 10 alternative study regions currently proposed under the criteria:

1. Pt. Arena to Pt. Año Nuevo
2. Bodega Head to Cambria
3. Pt. Reyes to Pt. Sur
4. Golden Gate to Pt. Lobos
5. Golden Gate to Pt. Sur
6. Pigeon Pt. to Lopez Pt.
7. Pt. Año Nuevo to Pt. Sur
8. Pt. Año Nuevo to Pt. Conception
9. Pt. Sur to Pt. Conception
10. Lopez Pt. to Pt. Conception

The team first discussed whether amount of habitat mapped was a valid criterion, given that there might be resources available to get areas mapped quickly. Rikk Kvitek presented a map of high resolution multi-beam sidescan sonar habitat mapping that has already been done for

some areas of the central coast. Though there are resources for further mapping, in reality, products of such mapping would not be processed and available for a year or so. Other sources of lower resolution habitat mapping data were discussed as well.

The team discussed the criteria related to stakeholder input such as distance they would need to travel and area over which they could have a working knowledge of the area. There was some concern that (1) these are not scientific criteria, and (2) no single individual should be expected to have a working knowledge of the entire study region, but decisions should be made based on collective knowledge of multiple individuals.

There was concern from the team that this list of criteria appears to have been approved by the team, yet they did not approve it in its entirety and in fact asked that at least one of the criteria be removed. John emphasized that their role is to provide input, not approval, and that their additions and comments from last meeting had been incorporated. John asked team members to rank the criteria according to their importance.

Some members of the team were concerned that they had not been given the opportunity in the past to articulate a consensus view.

Using their own implicit and explicit criteria, (outlined below), the team generated a list of four potential alternatives:

1. Pt. Año Nuevo to Pt. Conception
2. Pt. Año Nuevo to Cambria
3. Bodega to Cambria
4. Pt. Año Nuevo to Pt. Arena

A “straw poll” was taken to rank the relative level of acceptance of the above alternatives. It was understood that the purpose of this “straw vote” was to give the Blue Ribbon Task Force some sense of the strength of the SAT preferences. Mark Ohman abstained from the voting because he felt the team hadn’t taken enough time to discuss the scientific merits of each choice. He also mentioned other criteria – important unique habitat, centers of endemism and species of importance.

Scientific criteria the group discussed included:

- Upwelling cells: The consensus was that areas of relatively coherent oceanographic conditions, represented by the five main upwelling cells along the central coast, (centered off Pt. Arena, Pt. Reyes, Davenport, Pt. Sur, and Pt. Conception respectively), might be good proxies for biological and physical conditions. In particular, the team felt that dividing up upwelling cells should be avoided when placing boundaries of the study region.

- Size: The team felt it was important that the study region be large enough to encompass a self-sustaining network of reserves.

- Biogeographic boundaries: Major biogeographic zones were also considered by the group. There was agreement that Pt. Conception is a major break. Other breaks in the northern part of the central coast are more subtle.

- Species ranges: Ranges of particular species of interest, including endangered or threatened and keystone species were considered. Southern sea otter was one of the only such species with a major break in range in this area; it is found south of Año Nuevo but not north. Other marine mammals, marbled murrelets and black abalone were also mentioned, though these species do not have significant population breaks within this area, but may show genetic differentiation, differential survival or reproductive success, breeding activity, etc.

- Critical or unique habitat.

- Centers of endemism: A center of endemism has been noted for seaweeds in Monterey Bay, but this is likely to be a collector effect. Satellite populations of some southern species are also known from Monterey Bay.

- Replication of fishing fleets or gear types: There was discussion about the importance of picking an area that encompasses several different fishing fleets and/or different gear types within the same fishery so that the differential impacts on different uses can be studied. Some felt it important not to split a fishing fleet; i.e. entire fleets should be encompassed within the study region. Capturing an area with significant economic weight and relatively homogenous fishing activity and intensity was also discussed. Because of the variation in spatial scale and patterns of use among the various fisheries, achieving such homogeneity may be challenging.

- Potential to link up existing MPAs: A region stretching to Pt. Conception has the advantage of being close enough to potentially link up with the Channel Islands Marine Reserve network.

- Homogeneity of region and ease of management.

Some concern was expressed among team members about the process used to generate and vote among alternatives. Some felt there had not been sufficient time to fully elaborate the scientific criteria used to rank among options. Staff encouraged team members to provide detailed written comments about criteria and rankings to John Kirlin, John Ugoretz or Mike Weber.

Steve Barrager suggested the possibility of team members providing direct feedback to task force members at a future meeting (April 11-12). John Kirlin will talk with the task force chair about this possibility.

Staff discussed ways for team members to participate in other parts of the MLPA Initiative process during public meetings and as experts on a panel at next task force meeting (February 22). Interested volunteers should contact Initiative staff.

Team Challenges

Steve Barrager led a discussion of the challenges to this team moving forward. The challenges were based on Steve's reformulation of the team's response to the "How could we fail?" question posed at the January meeting. The challenges proposed were the following:

- Get the appropriate frame.
- Keep the frame broad so we cover all the significant issues and consider a full range of MPA strategies.
- Avoid advocacy (leave the policy judgments to the task force).
- Provide a comprehensive, quantitative evaluation of strategies.
- Speak to the task force with a clear voice.
- Incorporate the "lessons of the past."
- Utilize all available expertise.
- Balance time, money and quality.

Comments from the Public

There were comments from several members of the public. Issues they raised included:

- the need for considering recreational objectives of MPAs in decision-making and network design;
- the need for rules with clear, easily evaluated justifications;
- the importance of biological criteria in designating the central coast study region
- a caution against putting too much focus on fisheries enhancement relative to other goals of MPAs;
- the need to think ahead, beyond this process-oriented stage, toward implementation of a scientifically based reserve network; and
- concerns about the team's decision-making process around study region rankings.

The next Science Advisory Team meeting will be in Oakland at the Elihu Harris State Building, 10:00 a.m. to 4:00 p.m. on Wednesday March 23, 2005. A tentative April meeting was set for the same place and time on Thursday April 21, 2005. This meeting will only occur if needed.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Wednesday, March 23, 2005
10:00 a.m. - 4:30 p.m.

Elihu Harris State Office Building, Room 2
1515 Clay Street
Oakland, California

This meeting will be videotaped for future viewing on the Internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Review information from sub-teams for inclusion in master plan framework: reserve design principles, habitat classifications, information sources and needs.*
- *Review and comment on Revised Draft Master Plan Framework*
- *Discuss SAT organizational and operational issues*
- *Discuss SAT interaction with Blue Ribbon Task Force*
- *Begin discussion of peer review process*
- *Selection of members for Central Coast Science Sub-Team*
- *Begin discussion of information needs and data management*
- *Schedule future meetings and meeting agendas* ***(Please bring your schedules!)***

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1. Introduction and Update 10:00 a.m.
Steve Barrager, Chair, Master Plan Science Advisory Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG

2. Draft Master Plan Framework – Sub-Team Reports and Edits
A. Design principles sub-team report and discussion - *Steve Palumbi*
1. Design guidelines to include in master plan framework
B. Habitat sub-team report and discussion - *Steve Gaines*
1. Habitat definitions and guidelines to include in master plan framework
C. General discussion of revised draft and SAT comment - *Mike Weber*
1. SAT edits to revised draft

3. Draft Master Plan Framework – Biogreographic Region Definition
A. Defined regions in the Act - *John Ugoretz*
B. Master Plan Team definition of "Marine Regions" - *John Ugoretz and past MPT members*
C. Scientific guidelines for delineating biogeographic and zoogeographic regions - *Team*
1. Impact on replication of habitats within network
2. Potential SAT recommendation on definition, or defer to sub-team decision by March 30 or review at proposed April meeting?
3. Select representative(s) to discuss at BRTF April meeting

Lunch - Please be prepared to purchase lunch at nearby restaurants 12:30 p.m.

4. Information Needs and Data Organization
Laura Rogers-Bennett and Rikk Kvitek
A. Basic informational needs (habitat maps, etc.)
B. Screening, storing, linking and accessing the information

5. Central Coast Science Sub-Team selection
John Kirlin
A. Discuss operations and interactions/role of sub-team
B. Select members to form the Central Coast Science Sub-Team
C. Select representative(s) for April BRTF meeting to answer central coast study region selection questions

6. Peer Review of Technical Portions of the Master Plan
John Kirlin
A. Approaches to public policy appropriate peer review
    1. Federal OMB peer review document
B. Review a potential process
C. Identify portions of the MPF appropriate for formal peer review

7. Science Team Organizational Issues
A. Socioeconomic challenges for the team - *Astrid Scholz*
B. Interaction with the Blue Ribbon Task Force - *John Kirlin*

8. Critique of the Meeting (*What worked, what didn't work?)* and Team Challenges
Steve Barrager

9. Wrap up, Schedule of Future Meetings and Public Comment 4:00 p.m.
Public comment will be limited to time available at the discretion of the chair.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
MARCH 23, 2005 MEETING SUMMARY
Elihu Harris State Building
1515 Clay Street, Room 2
Oakland, California

SAT members present: Mark Carr, Steve Gaines, Doyle Hanan, Rikk Kvitek, Steven Murray, Mark Ohman, Jeff Paduan, Stephen Palumbi, Linwood Pendleton, Laura Rogers-Bennett, Susan Schlosser, Astrid Scholz, David Schwab, Rick Starr, William Sydeman, Dean Wendt

SAT members not present: Loo Botsford, Kevin Piner, Kenneth Schiff, Mary Yoklavich, Richard Young

Others present: Dr. Steve Barrager (chair, SAT), Heather Galindo (note taker; SAT support staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), Mira Park (DFG staff), John Ugoretz (DFG staff), Gina Wade (DFG staff), Mike Weber (MLPA staff) and approximately 15 members of the public

Acronyms used: California Department of Fish and Game (DFG), geographic information system (GIS), Marine Life Protection Act (MLPA), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Central Coast Regional Stakeholder Group (CCRSG), MLPA Central Coast Science Sub-Team (CCSST), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT)

Introduction

SAT Chair Steve Barrager welcomed the group and introduced Carrie Kappel and Heather Galindo as support staff for the meeting. He then outlined the agenda and announced there would be updates by John Ugoretz, John Kirlin, and Mike Weber followed by discussions on the following topics throughout the day:

- Central coast region
- Peer review of the draft MPF
- Balance between biology and social science on the SAT
- The interaction between the SAT and BRTF
- GIS presentation by Laura Rogers-Bennett
- Critique of meeting and topics for future meetings

John Kirlin thanked the SAT members for their work and Steve Barrager for his oversight of the SAT and his efforts to continue communication with SAT members between meetings. John Kirlin presented the following three updates:

- The BRTF was ready to select the central coast study region at the February meeting but lacked a quorum. The selection will be made at the April 11-12, 2005 meeting in Pasadena, CA.

- The revised draft MPF has had two major changes due to feedback from the SAT and other detailed input about steps in the process. The final MPF will be developed by March 25, 2005 and released to the public on April 4, 2005.
- The initial meeting of the Ocean Protection Council (established by the California Ocean Protection Act) was held on March 21, 2005 in Sacramento, CA.

John Ugoretz announced that the SAT membership has been finalized and introduced three new members:

- Susan Schlosser (Sea Grant Extension)
- Richard Young (economist, harbormaster of Crescent City Harbor)
- Kevin Piner (stock assessment, NOAA Fisheries)

Mike Weber thanked the SAT for the help with the draft MPF and indicated that sub-team input from the last meeting helped with three major issues: MPA design matters, habitats, and baseline information. He emphasized that considerable progress has been made, but there are still some parts of the draft MPF that need to be revised before the next version is released to the public.

Mike Weber then explained that a major difference between the current and earlier versions of the draft MPF is that the current version has a clearer description of the process for designing alternative MPAs in different regions. He drew attention to Figure 2 and Table 1 beginning on draft MPF page 15 as attempts to make clear the process of designing individual MPAs and the groups having responsibilities for the different aspects of the process. He pointed out that peer review is an important aspect not yet included in the process in great detail and concluded by asking for comments by March 25, 2005.

Draft Master Plan Framework: Sub-Team Reports

Design Principles Sub-Team: Steve Palumbi presented the latest draft guidelines for MPA design as it pertains to the section of the draft MPF beginning on page 25. The sub-team consisted of Mark Carr, Steve Gaines, Steve Palumbi, and Astrid Scholz. In an effort to provide concise guidelines that would apply to a network of MPAs anywhere along the California coast, the team came up with the following biological guidelines and noted that they expected other guidelines to be added to this list.

- The diversity of species and habitats to be protected prevents a single optimum network design in all environments.
    - The design is meant to be flexible.
    - The design criteria are to be based on biological characteristics, habitats and human interactions with the marine environment. The guidelines are meant to serve as envelopes around this more specific information.

- To protect adult populations, MPAs should have an extent of at least 5-10km and preferably 10-20km.
    - These numbers are based on adult neighborhood sizes and should be informed by data on the species in Appendix A of the draft MPF
- To facilitate dispersal between MPAs for important fish and invertebrate groups, MPAs should be placed within 50-100km of each other.
    - The spacing criterion is based on current data on larval dispersal for these groups.
    - The likelihood of larval dispersal between MPAs beyond this distance quickly decreases.
- Every key marine habitat should be represented in the MPA network.
- MPAs that stretch from the coast to deeper water will better serve the needs of species with nursery grounds or age-related shifts in depth usage.
    - Optimum MPA shapes are less well known, but it has been suggested that a wedge shape will provide opportunities to move between habitats, encompass a bigger number of habitats, and allow for larger protected areas in deeper water.
- For each habitat type, at least 3-5 replicate MPAs should be designed.
    - Replication will provide insurance against unpredictable environmental damage.
    - Replication allows data from networks to meet the requirements of experimental design and can therefore inform future processes.
- The placement of MPAs should take into account local resource use and stakeholder activities to lessen impact while maintaining the value of such use.
    - Astrid Schloz is the main information source on local resource use.
- Heterogeneous coastal habitats and variable current regimes suggest the establishment of additional MPAs around the five upwelling centers of the California coast.
    - Important coastal features include headlands, upwelling centers, sandy bottoms, and rocky outcrops.
    - Five major upwelling centers are caused by currents and are characterized by a dramatic increase in primary production and community composition of the area.

Steve Palumbi followed up by saying these main points are meant to lead design guidelines in a clear fashion, but the sub-team report contains more detailed information about the biology and oceanography involved in creating the guidelines. The sub-team then opened the discussion for feedback from the rest of the SAT. Feedback involved the following major points:

- The first guideline should contain language about the heterogeneity of human users as a further reason why one MPA design will not work for all goals.
- In the socioeconomic literature the term "impact" does not just imply a negative impact and should not be used as such. Negative versus positive impacts should be explicitly labeled.

- The idea of experimental design (including non-MPA reference sites) should be considered when designing the MPA networks to ensure that monitoring data collected from these sites is scientifically rigorous.
- Specific language about minimum requirements and considerations for MPA replicates should be included. (e.g. Differential habitat diversity within each MPA will affect the ability of MPAs to serve as replicates.)
- It should be made clear that emphasis on upwelling centers does not imply that areas between these centers are less important for MPA placement. Upwelling centers are important because they do have different biological community compositions and exhibit different larval/juvenile retention patterns than non-upwelling zones.
- Bullet points for the guidelines are likely to serve as important reference points for the design of the entire state MPA network so they should be concise and accurate while including a few more details than at present.
- Temporal extent of MPAs, gradation of fishing pressure, and how MPAs fit into an existing system of reserves, parks, and recreational areas are all missing from the guidelines.
- Size of MPAs should be defined as a linear measure parallel to the coastline and an explanation for choosing this measurement should be included. Remember that state waters end three nautical miles offshore and planning beyond this distance requires cooperation with the federal government.
- Concern was raised about limiting basis of habitat types to benthic or substrate types as this would exclude pelagic habitats. Do distinct habitats in deeper water need to be contiguous with habitats in shallower water?
- Suggesting a focus on MPA placement in areas that are also high-use may cause conflict downstream in the process, but these areas are also most likely to show the most dramatic effects of MPAs.

The SAT Design Principles Sub-Team agreed to incorporate the suggestions and provide a new draft by the March 25, 2005 deadline.

Habitat Sub-Team: The sub-team consisted of Steve Gaines, Mark Ohman, Jeff Paduan, and William Sydeman. Steve Gaines presented a framework for classifying important habitats based on classes of fixed features with associated oceanographic characteristics and biological communities. The sub-team recommended these types be included along with the substrate-defined habitats in the MPF:

1. Headlands and major points
    - Affect oceanographic climate and nutrient dynamics important for primary production
    - Often associated with strong offshore transport
    - Attributes are independent of substrate type
2. Major watersheds

- Plume of water from land affects salinity, temperature, nutrients, pathogens, and sediments that in turn affect the physical and biological systems close to watershed mouths.

3. Retention zones
    - Defined by movement patterns of plankton, larvae, and adults. One or more of these life history classes tends to remain in the local area rather than dispersing away.
    - Some fixed in space downstream of gyres and headlands or in embayments.

The SAT Habitat Sub-Team then opened the discussion for feedback from the rest of the SAT. Feedback involved the following major points:

- Variation within and between habitat categories should be taken into account.
- Should depth zones be included in a discussion of habitat types? Is it okay to not encompass all depth zones in a single MPA? Current classification of depth into four zones should be revaluated with the latest scientific information.
- The classes of features generally emanate from a relatively fixed point, but still vary greatly in time.
- Estuaries are critically important (e.g. as nursery habitat), although they are not currently listed in the draft MPF section on habitat types.
- Linkages between habitats should be included in the language about habitats due to their importance for different life stages of species.
- Although birds and mammals already have a high degree of federal protection, they should be considered in the MLPA process because they use these environments.

John Ugoretz added that information about how species use different habitat types and a list of major oceanographic features could be made available. It was suggested one role of the SAT might be to contribute to this type of information and also include information about sites of historical value.

Draft Master Plan Framework - Biogeographic Region Definition

John Ugoretz opened the discussion by emphasizing that the definition of biogeographic regions matters because the language in the MLPA calls for replication of MPAs within biogeographic regions. The MLPA specifically states there will be at least two no-take areas in each biogeographic region and all habitat types must be represented. The geographic boundaries of these regions can be changed. Currently, the biogeographic breaks are defined as being at Point Conception and Point Arena. John Ugoretz then asked the SAT to discuss these regions, a way to define them, and to select a member of the SAT to present these points to the BRTF at the April 11-12 meeting.

The SAT discussion began with historical background on the scientific definition of biogeographic regions versus biogeographic provinces. Borders of biogeographic provinces have traditionally been determined by the number of species range edges at a particular location with no attention paid to the importance or abundance of the species within the

regions. Biogeographic provinces are also usually based on the range edges of a limited subset of species (e.g. mollusks). More recent work has taken into account species abundance and community composition along the California coast. The results from these studies suggest there are important shifts in community composition at places such as Monterey Bay and San Francisco Bay. Another group of studies have found important shifts in fish species and plankton around Cape Mendocino. The importance of knowing if these biogeographic regions are stable over time was also discussed.

Concerning biogeographic regions the SAT came to consensus on the following points:

- The regions should not just be based on a snapshot in time, but should be stable over longer time scales.
- Biogeographic regions are defined as geographic areas distinguished by distinctive biological characteristics. This term is distinct from biogeographic provinces.
- There are biogeographic regions along the coast of California.
- Important breaks for some taxa indicate boundaries of these regions may fall at Point Conception, Monterey Bay, San Francisco Bay, and Cape Mendocino. Of these, there is the most consistent scientific evidence across taxa for a break at Point Conception. There is also some evidence that indicates that Cape Mendocino and San Francisco Bay are breaks between distinct biogeographic regions. All of these potential sites for boundaries between biogeographic regions are better supported scientifically than Point Arena.
- Information about community composition can potentially be more informative than individual species range boundaries.

Steve Murray and Steve Gaines offered to write up a description of the biogeographic regions for the draft MPF and submit it by March 30. Steve Murray will potentially present this information to the BRTF at the April 11-12 meeting.

Central Coast Science Sub-Team Selection

John Kirlin and others outlined the duties of the CCSST as follows:

- The sub-team will meet on a monthly basis until the final product is complete and delivered to the Fish and Game Commission in March 2006.
- At least one sub-team member should attend the monthly stakeholder group meetings although interaction between the two groups can occur outside of these meetings.
- At least one sub-team member should attend meetings of the BRTF and be prepared to answer questions or give briefings.
- The CCSST will serve as a link between the CCRSG and the entire SAT. A protocol for this will be developed by John Kirlin, John Ugoretz, Steve Barrager and Steve Murray.
- Both the SAT and CCSST will provide information and criteria to aid in the development of a list of MPA alternatives.

The following SAT members indicated an interest in participating in the CCSST: Mark Carr, Loo Botsford, Steve Gaines, Doyle Hanan, Steve Murray, Steve Palumbi, Linwood Pendleton, Laura Rogers-Bennett, Rick Starr, Dean Wendt, and Mary Yoklavich.

Steve Murray will potentially represent the CCSST at the April 11-12, 2005 BRTF meeting.

John Kirlin also reviewed the three options for the extent of the central coast study region that the BRTF will choose among at the April 11-12, 2005 meeting:

1. Bodega Head to Point Conception:
   PROS
   - Anchored by federal MPAs (Cordell Bank, Gulf of the Farallones and Channel Islands) and includes MBNMS
   - Large enough for flexibility and replicates

   CONS
   - Inconsistent with biogeographical and human use boundaries
   - Stakeholder involvement difficult (distance, variety and across SF Bay metropolis)
   - Splits Bodega Bay port activity area
2. Pigeon Point to Point Conception:
   PROS
   - Wide variety of habitats and uses
   - Includes areas of high value, high use and high knowledge
   - Point Conception is a major boundary, biogeographically and is listed as a biogeographical region boundary within the MLPA
   - A workable scale to complete implementation of MLPA by 2011

   CONS
   - Stakeholder participation over longer distance
   - Fishing uses more diverse south of Point Sur
   - Could rekindle Channel Islands antagonisms
3. Pigeon Point to Point Sur:
   PROS
   - High value, high knowledge, high use
   - Many available science institutions and stakeholders
   - Allows comparison to Point Lobos, already a reserve
   - One of seven study regions in earlier process

   CONS
   - Small area poses problems
     - May intensify conflict at next stage
     - Finding replicates could be difficult
   - Does not include pristine areas to south
   - Leaves the portion to Point Conception for later

Peer Review of Technical Portions of the Master Plan Framework

John Kirlin opened the discussion by referring to a memorandum by the U.S. Office of Management and Budget (OMB) concerning peer review. He then asked the SAT members to discuss which of the major sections in the draft MPF should be subject to peer review. The response is summarized as follows:

1. Section One: Introduction - Should not be subject to peer review.
2. Section Two: Design of MPAs and the MPA network - Should be subject to peer review.
3. Section Three: Management and Section Four: Enforcement - Should be subject to peer review by a panel with different expertise than that reviewing Section Two.
4. Section Five: Monitoring and Evaluation - Should be subject to peer review and potentially by the same panel reviewing Section Two.
5. Appendices A: Glossary, B: Master List of Species Likely to Benefit from MPAs, and H: Strategy for Stakeholder and Interested Public Participation should all be subject to peer review.

It was made clear that the SAT would not be doing the peer review themselves and that the peer reviews would be a highly public process. It was also suggested that some references be included in the draft MPF in anticipation of it being peer reviewed downstream.

Science Team Organizational Issues

Astrid Scholz gave a brief overview of the role and elements of socioeconomic research for marine resource management. She discussed some common misconceptions, noting that socioeconomic analysis is properly understood as a separate realm of data and information to support stakeholder processes and related decision-making mechanisms, rather than a form of policy-making itself. She presented an overview of economic concepts pertinent to the designation of MPAs, notably the concept of total economic value.

Typically, fishery and marine resource management, including many discussions about the MPAs to date, are focused on the most immediate and tangible values associated with the marine resources. These are the consumptive and non-consumptive direct use values that accrue to fishermen and recreationists. In addition, however, there are important indirect use values, notably the biological and ecological support functions fulfilled by marine ecosystems, which are also associated with economic value. In addition, there are various less tangible, but socially important values associated with the option and existence value of marine resources that should all be considered in public policy processes to manage the marine environment.

Astrid Scholz finished her presentation with an overview of various methods available to bring information about use patterns, their value, and other socioeconomic data to bear on the MLPA process within the time and resource constraints present. She concluded with summary statistics from the National Survey of Recreation and the Environment that suggest that several non-consumptive recreational activities such as bird watching and wildlife photography may be of considerable importance in California's ocean.

Astrid Scholz, Linwood Pendleton, and Richard Young will draft some language about socioeconomic research techniques for the draft MPF by March 25, 2005. This language will help clarify the current section on page 38 of the draft MPF.

Information Needs and Data Organization

Laura Rogers-Bennett and Gina Wade gave a presentation from the SAT Information Needs and Data Organization Sub-Team with input from Rikk Kvitek, Mira Park, and Paulo Serpa. Major points of the discussion included:

- Data collection should be at a scale relevant to the process being informed.
- It is important to identify data and data gaps in each area of specialization.
- What is the best way to store these data and make them accessible?
- Data should be easy to interpret (benthic topography image was given as an example).
- If the SAT decides to use a geodatabase, it will have to decide what data layers to include. The New Enterprise Geodatabase at UCSB could serve as an example.
- Discussion of data quality in decision support tools is critical.
- MPA design tools such as MARXAN, OCEANMAP, and Habitat Suitability Modeling require different amounts of effort to get them ready to use in a particular process.

It was decided the SAT should come up with a list of datasets that are available or desirable along with a list of key decisions for which these datasets would be useful by the next SAT meeting in May 2005. It was suggested the MPA design guidelines be used when forming this list of data sets. John Ugoretz and Astrid Scholz will come up with a list of data tools concerning fishing. Mark Ohman will lead a sub-team on important/rare habitats, ecosystems, and archaeological sites.

Team Challenges

Steve Barrager will send out an email to solicit feedback on how the process was going. A suggestion was made to streamline the process for sending documents to the SAT and be more explicit about which sections of the documents are most critical to review.

Public Comments

The public was asked to limit their comments to those appropriate for the SAT. Comments made from several members of the public included:

- Section of draft MPF describing types of MPAs should be more explicit about what is and is not allowed in each type.
- Concern about lack of discussion of alternatives to MPAs as a management strategy.
- Importance of considering the effect of MPAs on species interactions (e.g. predator-prey interactions) especially as they affects fisheries species.
- The idea of a network and connectivity between MPAs is unclear.

- Caution against setting an optimum reserve size that may not meet the different objectives of MPAs in various regions.

Upcoming Meetings

The next SAT meeting will be in Oakland at the Elihu Harris State Building, from 10:00 a.m. to 4:30 p.m. on Wednesday, May 11, 2005.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Wednesday, May 11, 2005
10:00 a.m. - 4:00 p.m.

Elihu Harris State Office Building, Room 2
1515 Clay Street
Oakland, California

This meeting will be videotaped for future viewing on the internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives
- *Review Science Team Guidelines*
- *Review of decisions and comments made at Blue Ribbon Task Force*
- *Update on Central Coast Project Area*
- *Review of Spatial Data Needs*
- *Begin to Evaluate Existing Central Coast MPAs*
- *General Issue Raising*
- *Update on Peer Review*
- *Update on Federal MPA Advisory Groups*
- *To schedule future meetings and meeting agendas* ***(Please bring your schedules!)***

1. **Introduction and Update** 10:00 a.m.
   Steve Barrager, Chair of the Science Team

2. **Science Advisory Team Guidelines** –
   Steve Murray and Steve Barrager

3. **Review of Decisions Made at Blue Ribbon Task Force Meeting in Pasadena, April 11-12-**
   Central Coast Study Region and biogeographic areas
   John Kirlin and John Ugoretz

4. **Public Comments from BLTF meeting in Pasadena**
   Steve Barrager

   Lunch - Please be prepared to purchase lunch at nearby restaurants 12:00 p.m.

5. **Update On Central Coast Study Region**
   John Kirlin and Laura Rogers-Bennett
   A. Ways the SAT can help the Central Coast effort
   B. Assessing Spatial Data Needs

6. **Evaluation of existing Central Coast Study Region MPA's**
   John Ugoretz and Steve Barrager

7. **General Issue Raising – Central Coast Study Region**
   Steve Barrager

8. **Update on Peer Review Effort**
   John Kirlin

9. **Update on Federal MPA Advisory Group**
   Steve Murray

10. **Wrap up, Schedule of Future Meetings and Public Comment** 4:00 p.m.
    Public comment will be limited to time available at the discretion of the Science Team Chair.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
MAY 11, 2005 MEETING SUMMARY
Elihu Harris State Building
1515 Clay Street, Room 11
Oakland, California

SAT members present: Loo Botsford, Mark Carr, Doyle Hanan, Rikk Kvitek, Will McClintock (representing Steve Gaines), Steven Murray, Mark Ohman, Jeff Paduan, Linwood Pendleton, Laura Rogers-Bennett, Susan Schlosser, Kenneth Schiff, Astrid Scholz, Rick Starr, Dean Wendt, Mary Yoklavich

SAT members not present: Steve Gaines, Steve Palumbi, Kevin Piner, Richard Young

Others present: Dr. Steve Barrager (chair, SAT), Heather Galindo (note taker; SAT support staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), John Ugoretz (DFG staff) and approximately eight members of the public

Acronyms used: California Department of Fish and Game (DFG), California Fish and Game Commission (F&GC), geographic information system (GIS), Marine Life Protection Act (MLPA), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Central Coast Regional Stakeholder Group (CCRSG), MLPA Central Coast Science Sub-Team (SST), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT), MLPA Statewide Interests Group (SIG)

Introduction

John Ugoretz updated the group on MLPA developments at DFG. Patty Wolf has stepped down from her position as marine region manager. Gary Stacey, a long-term DFG biologist and manager, will be taking her position. The BRTF approved the MPF and passed it back to DFG, where minor revisions will take place. One important revision will be to include a requirement for a feasibility analysis in the steps involved in proposing alternative networks. This analysis should treat the feasibility of monitoring, enforcement, and implementation for individual MPAs within a network as well as the network as a whole. If any proposed alternative fails to meet DFG's feasibility requirements, it will be kicked back to the group that proposed it. John Ugoretz also mentioned that portions of the document will be undergoing peer review, and he asked for help from the SAT in documenting the portions of the MPF they worked on with appropriate references from the literature (see action items at the end of this meeting summary).

Steve Barrager reviewed the guidelines for effective decision-making processes, emphasizing the importance of using a good, straightforward decision process, involving the right people in the decision dialogue, and using powerful tools for communication: creativity and analysis. The SAT is currently in the framing phase of the decision process, engaged in framing its role and responsibilities and the tasks before it. Within the ongoing decision dialogue, the SAT's purview is data and assessment of alternatives, while that of the stakeholder group is the articulation and advocacy of values. Dynamic simulation and optimization models could be

potential tools used by the SAT to explore design concepts and assess trade-offs among alternative MPA network designs.

Science Advisory Team Guidelines

Continuing within the framing process, Steve Barrager presented a preliminary set of SAT guidelines he developed in conversations with Steve Murray, Mark Carr, and others.

There was extensive discussion among the SAT about these guidelines and general consensus that they required significant revision. Contradictions between DFG expectations for the SAT and the roles laid out for them in the draft guidelines were revealed in the course of the discussion. This discussion lead to John Ugoretz's offer to revise the document to bring it more into line with the role envisioned by DFG and MLPA Initiative staff and outlined for the SAT in the MPF. In particular, the issue of whether the SAT can create and offer alternatives, whether they are alternative individual MPAs or MPA networks, was contentious. DFG and MLPA Initiative staff emphasized that the role of the SAT was not to propose alternatives, but rather to provide input and advice into the design process, stopping short of drawing lines on the map, and to critically evaluate proposed alternatives and make recommendations to the BRTF based on that evaluation. The SAT guidelines will be revised to better reflect and clarify these roles.

The following critical issues were raised in the discussion of the guidelines document:

Alternative generation versus evaluation

- DFG is not looking to the SAT to provide reserve network alternatives. The SAT can provide guidance, input and advice on features necessary in an effective network and will review the proposals developed, with the input of the SST, by the regional working groups.
- The way in which the SAT may provide input into features to be included in networks will depend on the timing, tone, and arena of their participation. The CCRSG must be given the time to wrestle with the important values issues first before scientific input is interjected into the process. As the CCRSG starts to consider alternatives, it will do so with the advice of the SST, and via that process, additional advice may be added to the MPF. The SAT will have a chance to weigh into the process by which the values developed in the regional planning process are implemented.
- SAT members have assumed from the beginning that they will provide guidance in the MPA network design process, but they are struggling with how best to do that. Clear guidelines and operating principles are required.

Communication and interaction with the BRTF

- The SAT can and should play a role in educating or informing the BRTF around pertinent science issues.

- Guidelines document should address interactions not only between individual SAT members and the BRTF, but also the SAT and BRTF as a whole.
- At least one SAT member should attend every BRTF meeting with Steve Barrager as an official representative of the SAT. This person would be able to field questions within the SAT's purview that arise during the meeting. They would also report back to the SAT on important scientific issues that arise during the BRTF meeting, either during scientific presentations, stakeholder input, public comment or BRTF discussion.
- There is a need for a formal process by which advice of the SAT is presented to the BRTF and to the public. Documents, recommendations, and other "official views" of the SAT developed by sub-committees or by the SAT as a whole must be vetted by the whole SAT before they are passed on to DFG, the BRTF, or the public.
- DFG/MLPA Initiative staff will notify the SAT of scientific issues to be discussed at upcoming BRTF meetings one to two weeks in advance. The SAT representative(s) to each BRTF meeting will be responsible for assessing SAT consensus on scientific issues to be considered by the BRTF prior to the BRTF meeting.

Communication of the "official views" of the SAT

- SAT discussions and recommendations are a matter of public record via the meeting notes and video recordings of the meetings. In addition, "official views" may be articulated in consensus documents produced by the SAT for use by the SAT, the BRTF, the regional stakeholder groups, or the public, or in presentations by the SAT to other bodies involved in the MLPA process.
- SAT members can be advocates for the use of science within this process and for the importance of a good decision-making process, but beyond that they should not act as advocates. Steve Barrager suggested they find others who can represent their personal opinions for them if they wish to advocate for a certain viewpoint in the process.
- Despite this, SAT members recognize that even scientifically grounded, consensus-derived recommendations may be perceived as 'advocacy' by members of the public.
- There is a need for guidelines for how the SAT will deal with scientific uncertainty in its decision-making and communications, e.g. SAT members should clearly represent areas where there is ambiguity or where key assumptions are being made.
- When it comes to matters of science, the SAT will best serve the process when it makes clear, unambiguous recommendations. Disagreements or differences of opinion should be made clear when they arise. The SAT should aim for clear, unambiguous recommendations based on the best available science and divorced from potential downstream implications of the recommendations.
- The SAT should describe explicitly the evidence for or against particular ideas and a description of how a given recommendation has been made, (e.g. it is based on weight-of-evidence analysis). When recommendations are based on modeling results or 'theory', some explanation of the level of support for a particular idea offered by these methods should be discussed.

- There are issues associated with SAT opinions/discussions being communicated by DFG or MLPA Initiative staff versus directly communicated by SAT members. If DFG or MLPA Initiative staff members make changes to SAT recommendations or documents, these must be communicated to and approved by the SAT before they are shared with the BRTF or public.

Communications by individual SAT members and interactions with the BRTF

- SAT members should not be construed as representing the SAT outside of SAT or other MLPA meetings. The MLPA Initiative and DFG staff can help SAT members to clearly distinguish when they are representing the SAT from when they are giving personal opinion, either as a scientist or as a citizen.

Communication with stakeholders (including the general public, stakeholder groups, the SIG, and the CCRSG)

- There must be a clear process whereby comments and questions from the public are communicated to and considered by the SAT. It is important to develop a two-way flow of information and communication between the SAT and stakeholders. Potential solutions include:
    - Communication to the SAT of important feedback or questions from the public by Steve Barrager, John Ugoretz, John Kirlin, and any members of the SAT who attend BRTF meetings
    - Presentations by stakeholder groups to the SAT
    - Summarized communications from the SIG, the CCRSG, and any other formal stakeholder meetings to the SAT
    - Reports to the SAT by the SST on the regional planning process
    - Creation of a SAT public comment/question line 1-800-SAT-MLPA and an online portal for public comments/questions to the SAT on the MLPA Initiative website

Dealing with data requests from the public or stakeholder groups

- There was strong discomfort expressed by members of the group with the wording in the section about data requests. In particular, the absoluteness of the language made individuals uncomfortable, especially given the time and funding constraints under which the SAT operates. SAT members receive many requests for data or scientific advice. They expressed concern that it would be overly burdensome to respond to and log every data request of this sort.
- In addition, SAT members do not control decisions about spending for data acquisition, though they can make resource requests of DFG and/or the MLPA Initiative. Jeff Paduan offered to rewrite this section.
- The SAT's roles with regard to data acquisition and data sharing cannot be completely delineated without more complete articulation of how the SAT and the SST will interact with the CCRSG.

Use of simulation or optimization models

- Such models may be used by the SAT to simulate alternative network designs, explore important design concepts, and assess trade-offs among designs based on different sets of values, goals, and objectives.
- These models should not be used by the SAT to produce specific alternative reserve networks.
- Optimization models depend on values and objectives as their inputs. Articulating values is not within the purview of the SAT. If the SAT intends to use such models, it will need input from stakeholders on the relative weighting of their values and priorities (e.g. fisheries production, recreational access, ecotourism potential, the preservation of particular species or habitats). The SAT itself should not be engaged in weighting values, and it could be very difficult to get regional working group members to come to consensus around the weighting of different values.
- Such models may be useful to scientists, but may have less perceived utility among stakeholders.

Review of BRTF Decisions from Pasadena

Kirlin reviewed decisions made by the BRTF at its April 11-12 meeting in Pasadena. Pigeon Point to Point Conception was approved as the MLPA Central Coast Study Region. The MPF, which included significant SAT input on design principles, habitat, and biogeographic regions, was approved and sent on to DFG. A revised MPF will be conveyed to the F&GC on May 23 at the joint meeting with the BRTF in Sacramento.

The process by which SAT input was incorporated into the MPF is proving instructive. Around design principles and habitat, draft language from the SAT was incorporated in the MPF early enough for public comment and subsequent revision. The biogeographic regions section took a different course. It was on a delayed schedule and consequently was not vetted by the entire SAT nor was it available for public comment prior to the BRTF's decision. The discussion of biogeographic regions had been framed in all public documents as a choice between 2, 3, or 4 regions. Discussion by the SAT did not alter the framing of the decision. Kirlin explained to the BRTF that there was best support scientifically for dividing the area into two regions, (based on the well recognized biogeographic break at Point Conception). He recommended that the additional information on bioregions be used to supplement the regional design processes.

Kirlin apologized for not getting SAT input and roles in the BRTF meeting well organized ahead of time. Kirlin suggested that biogeographic region recommendations made to the BRTF on behalf of the SAT could be revisited as the process of implementing and refining the MPF is intended to be adaptive. The SAT will reconsider the biogeographic regions question at their next meeting and try to develop a clear, unambiguous recommendation.

Central Coast Regional Stakeholder Group

John Kirlin reported that membership of the 32-person CCRSG would be announced shortly. This will be a well-balanced group that includes a wide range of different stakeholders, including scientists and science educators (scientists being treated as another stakeholder group in this portion of the process). A new staff has been retained to support the group, including Michael DeLapa, central coast project manager, and Dr. Mary Gleason of The Nature Conservancy, as well as a facilitation team, CONCUR, with deep experience in environmental conflict resolution. Two members of CONCUR, Scott McCreary and Eric Poncelet, will be working with the group. The CCRSG will be divided into north and south sub-teams in order to maximize access to relevant planning information and minimize travel times. The CCRSG will work hand in hand with the SST; the first meeting will be June 8 and 9 in Monterey. Money has been earmarked to support the planning process and pay for additional research in socioeconomics, assessment of existing MPAs, and development of monitoring and evaluation plans. Ecotrust has been contracted to collect additional data on fishing use. Non-consumptive use data are also being collected. Both will be available for the sub-regions by August.

Participants on the SST include: Mary Yoklavich, Laura Rogers-Bennett, Rick Starr, Mark Carr, Dean Wendt, Linwood Pendleton, Doyle Hanan, Steve Palumbi, Steve Gaines, Rikk Kvitek, and Steve Barrager. This group plans to meet prior to the June 8-9 meeting, in addition to having as many members as possible attend that meeting. Steve Murray indicated that he was willing to give input into intertidal areas where he has worked on the central coast.

SAT and Central Coast Regional Working Group

The discussion of the SAT and CCRSG document also provoked significant discussion around the roles and responsibilities of the SAT. In particular, the question of whether the duties of the SAT are purely reactive, (e.g. evaluation, assessment) or also proactive (e.g. proposal of alternatives) was a point of discussion. Specific comments relating to sections of the document are listed below. This document will also be revised with input from DFG staff and SAT members, who were encouraged to generate a list of questions to be answered and topics to be addressed within its pages, with a goal of creating a set of clear operating rules for participation.

Goals and objectives

The SAT discussed a variety of goals and objectives for its interaction with the CCRSG, including:

- To interpret and evaluate the extent to which proposed alternatives meet the scientific goals articulated in the MLPA;
- To identify and provide relevant datasets to support alternative generation by the CCRSG and evaluation of those alternatives by the SAT;
- To develop tools and approaches during the central coast study region effort that can be used in planning efforts in the rest of the state. These tools and approaches should

allow the coordination and scaling up of the regional working groups' products to meet the overall statewide network goals.

Members of the SAT objected to language in this section that seemed to suggest that they absolutely would use simulation or optimization models to generate alternatives. This language will be revised to reflect the fact that the SAT *may* use these models to explore design concepts and evaluate trade-offs, if it decides they are useful.

Design approaches that include all three types of MPAs

This section should reflect the lack of theory available to deal with different types of MPAs and their effects. The three types of MPAs could be seen as representing a gradient in harvest pressure. The SAT could explore the design implications of this variation in harvest intensity and develop some concrete principles to guide the use of these different types of MPAs in network design. The idea of ocean zoning might be brought to bear under this heading.

Developing alternative sets of MPAs

As with the SAT guidelines document, this section requires some revision to clarify SST members' roles in helping the CCRSG to generate alternatives. According to DFG staff, the SAT and SST should provide guidance on 'concepts' and provide information about trade-offs without outlining specific alternatives. In essence, the SAT can come up with recommendations and guidelines for *how* lines should be drawn on maps, but should not engage in actually drawing those lines on the maps themselves. This is the purview of the CCRSG. Language about using simulation models to develop alternatives will be revised or removed to reflect this.

DFG and MLPA Initiative staff expect SST members to be involved in a dialogue with the regional stakeholders, providing scientific information and advice that can inform their decision-making. SST members will not have voting rights or decision-making power in that process. Outputs of that process will be brought to the SAT for evaluation.

Concern was expressed that this framework treats scientists as "second-class citizens" and might not result in the strong use of science in the decision-making process.

Assessing existing MPAs

This should include assessing biological, sociological, and economic impacts of existing MPAs and other regulations.

Identifying and assessing revised or new MPAs

Again there was a contradiction between the expectations of DFG and MLPA Initiative staff and those of the SAT chair around whether the SAT would be involved in proposing new individual MPAs.

Clarifying likely outcomes of alternatives

It was suggested that language be added to make clear up front that SAT members may act as principal investigators, staff or consultants on projects aimed at collecting additional data to support the MLPA Initiative, and that some of those projects may be funded by the MLPA Initiative.

Participating in the regional planning meetings

All SST members are encouraged to attend all CCRSG meetings, but at a minimum, one member of the SST must be present at every meeting. One person should act as a liaison between the CCRSG and the rest of the SST and the SAT to make sure communication channels are open. It is not clear yet whether SST members will sit at the table and participate though this is likely; this will be left up to the professional facilitators to decide. Questions of substance that arise in the CCRSG process should be logged and both questions and answers communicated to and from the SAT with transparency. This could be proposed as a task for the professional facilitators. Evaluation of alternatives generated by the CCRSG will take place within SAT meetings, separate from the CCRSG.

Assessing Spatial Data Needs

Laura Rogers-Bennett and Will McClintock reported on progress in developing an extensive GIS database that would house a suite of data layers that might be used by the public, the SAT and the regional working groups moving forward. The data will be housed on an ArcIMS server and be accessible to the public via the worldwide web. An anticipated 300 gigabytes of data will be available for online access or download. Will McClintock will be maintaining the database, which will be based at UC Santa Barbara in Steve Gaines' lab. This database is a joint project of DFG, NOAA's MPA Science Center, the Monterey Bay National Marine Sanctuary, and The Nature Conservancy; it will house shared data from all these entities with version control that will ensure that everyone is working from the most current datasets.

Rogers-Bennett emphasized the need for the SAT to think strategically now about how they would like to use this database, what questions they would like to answer with it, and what data need to be in it. She articulated the need to move from the somewhat vague goals like "ecosystem health" laid out in the MLPA to quantitative, measurable indicators and metrics. This top-down approach will highlight data needs. It should be accompanied by a pragmatic bottom-up approach that takes into account current data availability. Rogers-Bennett distributed a list of the current data layers in the database and gave the team two weeks to review this list and address the following questions:

1. What of this list would be most important to help you and/or the stakeholders make decisions?
2. Which data will be most useful to have in an online format?

John Ugoretz reminded the group that any tools or analyses the SAT planned to provide for the CCRSG would need to be ready by July, when the central coast planning process begins in earnest.

Will McClintock strongly encouraged the group to generate a list of ways in which they anticipated using this database and questions they hoped to answer with it, so that it can be structured most effectively to facilitate those uses.

The SAT discussed whether this database would be duplicative of efforts already being put into OceanMap (the GIS interface developed by Environmental Defense and Ecotrust) and used to collect new information on use patterns. McClintock remarked that the UCSB GIS could be similarly modified to allow data collection in this way if this were a priority for the group. In addition, data collected by Environmental Defense and Ecotrust can easily be added to this database.

Central Coast Regional Profile

John Ugoretz presented the draft regional profile outline put together by Paul Reilly for the central coast study region. The regional profile will be used by the CCRSG and SST and must be ready by July. Some items on this list will be developed in partnership with the SAT. John asked the SAT to consider:

1. Are there other items that should be added to the regional profile to assist in decision-making?
2. Are there items on this list that the SAT could help prepare?

Individual SAT members volunteered to work on specific pieces of the profile (see list of action items at the end of this summary). The whole SAT was asked to review the list of species likely to benefit from MPAs, which was developed by the original master plan team, for additions, removals and other edits. Bill Sydeman was volunteered to think about birds, mammals, and other large animals that are currently not on the list. Revisions will be discussed at the next SAT meeting. The species list has been revised, eliminating species that are rare or unknown on the central coast, and adding a description of the various life history traits that caused the master plan team to target those species for inclusion in the list originally.

SAT members provided some initial feedback on the draft regional profile outline. Rocky shoreline use, including educational uses of the shoreline, visitation and ecotourism, and the presence of high use areas, was mentioned as an important category to add. Intertidal habitats will be included in the habitat types description and Steve Murray will help to pull together available information on high use shoreline areas. The non-consumptive use study will also address tidepooling as an activity. Aquaculture activity and access points for subsistence fishing and diving were also suggested for addition to the regional profile. Astrid Scholz suggested a dataset for subsistence fishing that has been collected out of Santa Barbara.

Issues to be Considered the During Central Coast Study Region Planning Process

The SAT engaged in a brainstorming exercise designed to identify as many of the issues that need to be considered during the central coast study region planning process as possible.

Issues raised by SAT members

- Reframing of MLPA goals into testable science questions with reference to network design and communication of the answers to those questions back to the process
- Identification of the biological or ecological communities or systems that can be most effectively protected using MPAs
- Awareness of the perceptions of the SAT by the CCRSG with regard to roles, process, responsibilities, limitations, etc.
- Development of clear operating principles for the SAT
- Ensuring that appropriate habitats and identifiable control sites are included in networks to allow for rigorous scientific evaluation of MPA performance and long term monitoring
- Coordination of MPAs with existing state and federal fishery management strategies
- Consideration of human population growth and other demographic changes in long-term planning
- Accounting for the disproportionate amount of expertise and knowledge in the northern group of the central coast study region
- Balanced discussion of diverse uses and stakeholder groups, not just commercial fishing
- Staying within the formal expectations of the process, not over-reaching
- Balanced consideration of both ecosystem and fishery goals
- Clear articulation of the role of scientific uncertainty in environmental and socioeconomic data and in the planning process.
- Consideration of the value of MPAs in estimating fishing effects and incorporation of that goal into the design process by the CCRSG and the BRTF
- Development of quantitative goals and adaptive management endpoints for the central coast study region so that adaptive management strategies can work
- Effective monitoring
- Effects of spatial reserve configuration of reserves on population persistence and fishery yield
- Incorporation of an ecosystem perspective versus a single species perspective
- Need for the development of specific questions to be answered using the geodatabase
- A process that works
- Well articulated roles and responsibilities for the SAT, developed with SAT input

- Consideration of how the spatial distribution of human populations along the coast might affect the acceptability of certain MPA locations and the magnitude and timing of the subsequent ecosystem response to protection within those MPAs
- Cost-benefit analysis of MPA implementation
- Development of techniques for inclusion of non-commercial uses, which are not easily quantified, in the cost-benefit analysis
- Clear process for achieving consensus within the SAT before interacting with other groups such as the BRTF and regional stakeholder groups
- Improved communication between the CCRSG and SAT
- Momentum and a good model with which to finish this process for the rest of the state
- Adherence to the time schedule; public outreach and communication to avoid surprises, particularly towards end of process
- Clear distinction between deliberations and facts when SAT views are presented to groups outside the SAT; clarity about levels of consensus
- Devotion of sufficient time and effort by SAT members to developing evaluation methodologies for the MPAs
- Consideration of the fact that the central coast, as the pilot study region, might not include factors important to other regions in the state (e.g. water quality)
- Documentation of failures of process versus failures in knowledge
- Consideration of scientific data when lines on the map are drawn
- Attention to and energy input into the phases of implementation and monitoring that come after the design process
- Early assessment of feasibility of alternatives with advice from DFG

Issues raised by the public

- Importance of achieving an outcome informed and influenced by science and ensuring that science-based outcome is not undone by the F&GC
- Very clear lines of communication among public, SAT, CCRSG, SIG, etc.
- Limited opportunities for SAT to provide input into network design
- Requirement for concise, focused input from the SAT, based on consensus opinion of its members
- Attention to data, products, tools, etc that might be useful for future planning regions
- Ability to communicate SAT advice clearly without jargon to non-scientists especially those in the CCRSG

Evaluation of Existing Central Coast Study Region MPAs

John Ugoretz distributed the draft evaluation of existing MPAs document (available online). Recommendations about existing MPAs that used to be in this document have been removed.

It now just includes: existing MPAs with their site name, history, area, shoreline length, depth range, (area, length and depth numbers are prone to errors, but DFG is working on fixing them), habitat types, existing regulations, primary objectives (though many existing MPAs didn't have any original goals or objectives), existing enforcement, baseline and ongoing monitoring and research studies, published and unpublished references (numbers refer to the bibliography number), and a basic evaluation. The SST was asked to focus on the 13 areas included in the central coast study region: ranging from the special closure at Año Nuevo down to Vandenberg State Marine Reserve.

John Ugoretz requested that the SST:

(1) Think about what data or assessment are needed for the existing MPA evaluation. Consider whether we can get that data via hired contract help; and

(2) Read through and evaluate the descriptions, lists of existing studies, habitat types, and basic evaluations.

The ongoing evaluation of existing MPAs by Charlie Wahle and colleagues at NOAA's National MPA Science Center was discussed as a potential source of additional information.

Overall Meeting Evaluation by Participants

What worked well

- Had the flexibility to address important issues when they arose

What did not work well

- Skipped around in the agenda without explanation or clear reason
- Spent too much time editing documents online
- Did not have all the pertinent documents ahead of time
- Did not end on time

Issues that remain

- Need to develop a clear process by which decisions are made by the SAT
- Need a clear point at which things become consensus
- Need to finalize SAT guidelines
- Need clarity around where and when SAT is empowered to make choices
- Status of draft MPF needs to be made clear
- Need to formalize how the SAT can educate the BRTF (with a coordinated set of presentations that cover the wide range of topics at once)
- Need to continue to improve the communication of upcoming agenda items, preparation requirements, items to be discussed, and decisions to be made, prior to each SAT meeting

- May need to meet more often in order to meet the challenges of this fast-moving, complex process
- Need to continue to pay attention to the draft MPF and the BRTF while turning our primary energy toward the central coast planning process
- Need to clarify the role of staff versus SAT in communicating SAT views to the BRTF

Action Items

1. Literature references for SAT advice in draft MPF

   Send to John Ugoretz
2. SAT guidelines document

   John Ugoretz will revise document and send back out to SAT. Jeff Paduan will help on section on the central coast study area. Steve Barrager and Steve Murray will also be involved.
3. List of questions spatial data will help answer

   Necessary to structure how database information will be made available online

   Send to Will McClintock
4. SAT representative needed for BRTF/DFG meeting on May 23 in Sacramento
5. List of existing datasets/data layers and functionality of database DUE MAY 25

   Send to Laura Rogers-Bennett
6. Items to add to regional profile list DUE JULY 1

   Send to John Ugoretz
7. Contribution of regional profile products DUE JULY 1
   a. Habitat Types - Rikk Kvitek
   b. Oceanic Features - Jeff Paduan
   c. High Use Area Data - Steve Murray
   d. Subsistence Fishing Areas - Astrid Scholz
   e. Fisheries Data - Kevin Piner
   f. Economic Values of Fisheries - Richard Young

   Work with Paul Reilly
8. Review list of species likely to benefit from MPAs DUE JULY 1, 2005

   William Sydeman – Birds, mammals, sea turtles

   Whole SAT to review

   Work with Paul Reilly
9. List of potential contributions to the central coast planning process from SAT (Reactive & Proactive) DUE JULY 6, 2005

   Jeff Paduan and anyone else

Bring to next meeting

10. Review evaluations of existing 13 MPAs between Año Nuevo and Vandenberg State Marine Reserve DUE JULY 6, 2005

    Members of Central Coast SST (Led by Mark Carr and Rick Starr)

    a. What data or assessments are needed, and can these be obtained through contracts?
    b. Read and evaluate descriptions, lists of existing studies, habitat types, and basic evaluations.

Agenda Items for Next Meeting

1. Revisit discussion of biogeographic regions
2. Central coast study region stakeholder group embers
3. Discussion of species likely to benefit from MPAs
4. Central coast regional profile
5. SAT guidelines document
6. Discussion of potential contributions from the SAT
7. Evaluations of existing MPAs in central coast study region

The next SAT meeting will be on July 6, 2005. Location TBD.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Wednesday, July 6, 2005
10:00 a.m. - 5:30 p.m.

Ludwig Community Center
864 Santa Rosa Street
San Luis Obispo, California 93401

This meeting will be videotaped for future viewing on the internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives
- *Review and adopt Science Advisory Team (SAT) guidelines*
- *Report from the Central Coast subteam on the first Central Coast Regional Stakeholder Group (CCRSG) meeting*
- *Discussion of the formal interaction and dialog between SAT and CCRSG*
- *Review of draft species list for MPA planning*
- *Review of draft list of topics and draft presentations to the Blue Ribbon Task Force*
- *Schedule future meetings and meeting agendas* ***(Please bring your schedules!)***

10:00 a.m. 1. Welcome and review of agenda
Steve Gaines, Acting Chair of the Science Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG

10:10 a.m. 2. Revised SAT Guidelines – *Steve Gaines*
A. Review revised SAT guidelines
B. Clarify the role of the SAT, including possible use of analytical tools
C. Discuss SAT leadership, possible executive committee
D. Discuss workload of SAT members
E. Other perspectives: Input from other scientists – *John Kirlin*
F. Adopt SAT Guidelines

11:00 a.m. 3. Report from Central Coast Subteam – *Mark Carr*
A. Composition, structure, and role of the SAT substeam
B. Questions and Concerns posed by stakeholders to SAT (including phasing)
C. Process for formal dialog between CCRSG and SAT – *John Kirlin*

11:45 a.m. 4. Draft List of Decision Framing Topics for Blue Ribbon Task Force - *Steve Gaines*
A. Review list of topics
B. Provide feedback and suggestions
C. Identify scientists to prepare and give presentations and review schedule

12:30 p.m. **Lunch** - Please be prepared to purchase lunch at nearby restaurants

1:30 p.m. **5. Species Likely to Benefit List**

A. Review list - *John Ugoretz*
B. Review need for SAT guidance on prioritization
C. Sub-team on status of species review

2:15 p.m. **6. Draft Presentations for the Blue Ribbon Task Force**

A. Ecosystems and ecosystem services – *Mark Carr*
B. Marine habitats – *Rikk Kvitek*
C. Use of economic data in design and evaluation of MPAs – *Linwood Pendleton*

3:45 p.m. **Break**

4:00 p.m. **7. Discussion of Draft Presentations** – *Steve Gaines*

A. Review of key points from draft presentations
B. Review handouts from draft presentations
C. Feedback and suggestions for draft presentations

5:00 p.m. **8. Wrap up, Schedule of Future Meetings and Public Comment**

A. Review SAT meeting duration and frequency, SAT meeting agendas

Central Coast Regional Stakeholder Group meetings

- Jul 7-8, 2005 in Morro Bay
- Aug 9, 2005 in Monterey area
- Aug 11, 2005 in Morro Bay area
- Sept 6, 2005 in Monterey area
- Sept 8, 2005 in Morro Bay area
- Oct 4, 2005 in Monterey area
- Oct 6, 2005 in Morro Bay area
- Nov 9-10, 2005 in Monterey area
- Dec 6-7, 2005 in Morro Bay area

Blue Ribbon Task Force meetings

- Jul 11-12, 2005 in Santa Barbara
- Sept 28-29, 2005 in San Luis Obispo/Morro Bay area
- Nov 29-30, 2005 in Monterey/Santa Cruz area

Proposed SAT Meetings

- July 28 OR August 2, 2005
- August 23 OR 24 OR 25, 2005
- September 19, 2005
- October 18 OR 19 OR 20, 2005
- Week of November 21, 2005

Public comment will be limited to time available at the discretion of the Science Team Chair.

5:30 p.m. **Adjourn**

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
JULY 6, 2005 MEETING SUMMARY
Ludwick Community Center
864 Santa Rosa Street
San Luis Obispo, California 93401

SAT members present: Loo Botsford, Mark Carr, Steve Gaines, Doyle Hanan, Rikk Kvitek, Jeff Paduan, Stephen Palumbi, Linwood Pendleton, Kevin Piner, Susan Schlosser, Astrid Scholz, Rick Starr, Dean Wendt, Mary Yoklavich

SAT members not present: Steven Murray, Mark Ohman, Kenneth Schiff, William Sydeman, Richard Young

Others present: Michael DeLapa (MLPA staff), Heather Galindo (note taker; SAT support staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), John Ugoretz (DFG staff) and approximately 15 members of the public

Acronyms used: California Department of Fish and Game (DFG), geographic information system (GIS), Marine Life Protection Act (MLPA), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Central Coast Regional Stakeholder Group (CCRSG), MLPA Central Coast Science Sub-Team (CCSST), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT)

Introduction and Agenda Review

SAT member Steve Gaines introduced himself as acting chair for this meeting only and reviewed the agenda for the meeting. Changes from the original agenda included adding a discussion of when the SAT presentations would be made during the next BRTF meeting on July 11-12, 2005 in Santa Barbara and moving the discussion of the draft list of decision framing topics for the BRTF until after the draft presentations.

John Ugoretz announced that the SAT presentations to the BRTF would be on Tuesday, July 12 beginning at 8:30 a.m. The presentations should be about fifteen minutes each plus additional time for discussion.

Revised SAT Guidelines

Steve Gaines explained that the draft SAT guidelines had been revised according to the discussion at the May 11, 2005 SAT meeting. He then opened the discussion by asking for any comments on the latest version to assist in the final round of editing.

Comments from SAT members included:

- In the paragraph at the top of page 2 beginning "In conducting", the second sentence should read "The SAT will apply best professional judgment to identify and bridge uncertainties in the available information."
- The structural relationship between SAT members and CCSST is still a bit unclear.

- A concern was voiced that scientists were the only stakeholder group without a vote in the CCRSG. Ugoretz responded by announcing that Dr. John Pearse has been added to the CCRSG with Dr. Steve Webster as his alternate.
- It should be made clear that the advisory role of the SAT requires responses to science-related questions in the MLPA Initiative process, but does not include responding to requests for additional data collection.

John Ugoretz explained there was now a website at which people could submit questions to the SAT. John Kirlin, executive director of the MLPA Initiative, added that he and Central Coast Project Manager Michael DeLapa would initiate a discussion on setting clear bounds for communications with and expectations of the SAT at the CCRSG meeting on July 7-8, 2005. This discussion would include reading a passage about defining what "best available science" means. Michael DeLapa added that CCSST leaders Mark Carr and Dean Wendt, along with support staff, would be responsible for collecting questions for the SAT at CCRSG meetings and then communicating those questions back to the SAT. He acknowledged that guidelines still need to be developed for questions arising between CCRSG meetings.

John Ugoretz finished the discussion by asking that all text edits be emailed to Steve Gaines who will then send out the final version. Each SAT member must approve or disapprove of this final version via an email response in a timely fashion.

MPA Proposal Evaluations

Astrid Scholz opened a discussion on analytical tools by announcing that she had participated in a conference call on the topic with fellow team members Laura Rogers-Bennett and Rikk Kvitek. The call discussed the status of available tools and how they might be useful for the SAT in the MLPA process. John Ugoretz responded by announcing that Laura Rogers-Bennett was no longer a member of the SAT and her replacement was still being determined. He then explained that the current analytical tool being used by the CCRSG is a GIS-based tool used to visualize data layers. He stressed that it was not an optimization or design tool and compared its abilities to the analytical tool ArcView. He added it is the purview of the SAT to evaluate and recommend analytical tools, but these tools must be ready to use by August or September 2005 including any data needed to use the tools effectively.

SAT members responded with the following comments:

- Loo Botsford suggested an analytical tool that his lab has developed might be useful. The tool evaluates the persistence of populations based on the location of MPA polygons due to levels of connectivity via larval dispersal. The tool is currently being used to investigate an area around Point Reyes, but could be adapted for other locations.
- A suggestion was made to go about looking for and evaluating analytical tools in a systematic way and taking advantage of existing technical reviews.
- Useful tools beyond basic visualization tools have already been used in similar MPA planning processes in places like South Africa, Australia, and Florida.

- It is important to think about the questions that need to be answered and the time frame plus level of detail required to answer them.
- Evaluation tools used by the SAT should use criteria consistent with the MPA design guidelines created by the SAT for use by the CCRSG and BRTF. In addition, these tools should be explained to the BRTF.
- The process of communication between the SAT and CCRSG needs to be formalized to avoid creating a disconnect in the ways the two groups use data relevant to the MLPA Initiative.
- It is important to note that the CCRSG will be working at a coarser scale in developing MPA alternatives than the SAT will be in evaluating those proposals. The differences in scale will likely necessitate the use of different tools by the two groups to keep the process running smoothly.
- It is recommended to create a SAT sub-team to develop guidelines for evaluating MPA alternative proposals, including identifying appropriate tools to be used in this process. John Kirlin strongly agreed with this suggestion and added that the current GIS-based tool being used was already under contract and would be used by the CCRSG. Appendix F of the draft MPF includes templates for creating alternative MPA proposals.

The SAT MPA Proposal Evaluation Planning Working Group was created to meet the following objectives:

- Determine needs for staff support and resources in the evaluation process
- Review template for proposals as outlined in Appendix F of the draft MPF
- Consider approaches to and draft criteria for evaluation of MPA proposals
- Review potential tools that might be useful in the evaluation process
- Present proposed criteria and approaches at the next SAT meeting

The group will be comprised of SAT members Steve Gaines (leader), Loo Botsford, Jeff Paduan, Steve Palumbi, Kevin Piner, Astrid Scholz, and Mary Gleason (MLPA Initiative staff contact). The group will meet over lunch to begin their work.

John Ugoretz and John Kirlin reiterated that funds and support staff are available to facilitate data collection or analysis, the purchase of analysis tools or equipment, writing documents, or other needs identified by the working group. They requested advance notice of support needs when possible.

John Ugoretz and Michael DeLapa emphasized that the CCRSG is being encouraged to create a few fully developed proposals by October or November 2005 so that the SAT will have time to evaluate them before they are due to the BRTF in January 2006. The proposal creation and evaluation processes should be as integrated as possible to adhere to this timeline.

John Kirlin reminded the SAT members that they have a clearly defined statutory role in the MLPA Initiative process and that the MLPA Initiative staff will explain that role when it is called

into question by other parties. He pointed out the difference between the MLPA wording calling for the use of “best readily available science” and how this differs from the wording in the Magnuson-Stevenson Fisheries Act which calls for “best available science”. The addition of the term "readily" into this phrase is important and serves to emphasize timeliness over quality. When the science is not available, the bias is to action and not to analysis. The process must continue. A SAT member responded by remarking that while a lack of complete information should not halt the process, it also should not be a barrier to future investigation.

John Kirlin continued by calling for a structure for interaction between the SAT, CCSST, and CCRSG, and added that the SAT should focus on identifying questions it is able to answer. Requests for scientific input should be directed into the formalized process when they come from outside parties. A process of peer review and the involvement of additional scientists would be included where needed. He ended by remarking that the MLPA does not require cost benefit analysis or the precautionary principle so he has avoided using that language. Monitoring plans are being developed and this is something with which the SAT can help.

John Ugoretz added that the director of DFG reviewed the final list of SAT members and that the SAT has his support.

Report from Central Coast Science Sub-Team

CCSST member Mark Carr presented a summary of the first CCRSG meeting held in Monterey on June 8-9, 2005, including the following main points:

- CCRSG members introduced themselves and their areas of expertise.
- CCRSG members broke into subgroups to further identify areas of expertise including how this expertise was laid out geographically.
- The CCSST will be split up by region:
    - North – Mark Carr (lead), Rick Starr (alternate lead), Doyle Hanan, Jeff Paduan, Mary Yoklavich
    - South – Dean Wendt (lead), Linwood Pendleton (alternate lead), Steve Gaines, Doyle Hanan
- The CCSST role is to respond to questions at CCRSG meetings in real time when possible and to effectively communicate all other questions back to the entire SAT. The sub-team will not participate directly in the process of deciding on MPA designs.
- Proposed protocol for communicating science questions is to record them during the CCRSG meetings, finalize the list publicly, then email the questions to the SAT for thought and discussion before the next SAT meeting.
- A question was raised by a SAT member at the first CCRSG meeting concerning the phasing in of MPA networks.
- Concerns raised about potential bias in the SAT at the CCRSG meeting have already been addressed at today’s SAT meeting by John Kirlin.

A request by another CCSST member for support to organize sub-team meetings outside the SAT and CCRSG meetings was agreed to by John Ugoretz. A CCSST member also suggested it would be best to have a social scientist on the north sub-team and suggested Richard Young or Michael Dalton as possibilities.

Species Likely to Benefit List

John Ugoretz called attention to Table G-1 (Finfish Species Likely to Benefit from Marine Protected Areas) and Table G-2 (Invertebrate, Alga, and Plant Species Likely to Benefit from Marine Protected Areas). He requested the SAT create a sub-team to assess the current population status for these species along with a characterization of how these species would be affected by the implementation of an MPA (e.g. affected directly vs. indirectly). Paul Reilly of DFG created sublists containing those species relevant to the central coast study region, but the SAT was reminded that all species on the master list would need evaluation at some point in the MLPA Initiative process. John Ugoretz referred the SAT to the draft MPF for a description of how tables G-1 and G-2 were originally constructed.

Major points in the discussion included:

- Concern that prioritizing certain species would involve value judgments. John Ugoretz responded by saying that the MLPA calls for improving the status of individual species and it is important to know which species are likely be helped by the creation of MPAs.
- Protocol for prioritization seems a bit unclear but would likely involve consideration of future fishing behavior, size and shape of MPAs, and species life histories. John Ugoretz agreed and said more species could be added to the list (e.g. birds, mammals, etc.) if strong evidence suggested they would be likely to more or less directly benefit from MPA implementation.
- Suggestion that impact of MPA implementation on species could be looked at in two ways:
    1. How species are currently affected by fisheries or habitat interactions, and
    2. How species might respond to future habitat protection.
- Call for clearer definitions for the terms "benefit" and "likely". John Ugoretz suggested a definition for "benefit" as follows: Species whose population or size structure would likely increase due to the removal of fishing pressure by MPA implementation.
- Michael DeLapa mentioned that Charles Wahle, Director of the National MPA Center Science Institute, would make a presentation titled "How Is Your MPA Doing?" at the July 7-8, 2005 CCRSG meeting. He encouraged the SAT members to think about which species on the master list might serve as good indicator species for MPA monitoring and evaluation.
- Important to consider whether benefits are determined by taking current fisheries management into account. Also raised the point that species most likely to benefit could likely be those not currently monitored.
- If possible, identify species likely to undergo population size or range changes due to climate change, decadal oscillations, etc.

- Revisions to this list do not limit other discussions such as economic benefits of non-consumptive uses.

A SAT Species Likely to Benefit Sub-Team was created with the following members: Doyle Hanan (leader), Loo Botsford, Steve Palumbi, Kevin Piner, Susan Schlosser, William Sydeman, Dean Wendt, Mary Yoklavich, and Mary Gleason (MLPA Initiative staff contact).

The goals of this subteam are:

- Develop clear guidelines for how species should be selected for the list (including definitions of the terms "likely" and "benefit").
- Delineate reasons why and how species might be expected to benefit from MPA implementation.
- Present revised list at next SAT meeting.

Draft Presentations for the BRTF

Drafts of presentations intended for the July 11-12, 2005 BRTF meeting were given. Main points of the presentations and feedback from the SAT and members of the public were as follows:

Ecosystems and Ecosystem Services – Mark Carr (lead)

Main points:

- Defines an ecosystem in terms its components of structure, function, services, and connectivity
- Focus on central coast region, species interactions and ecosystem-based management
- Large-scale marine ecosystems defined by oceanographic circulation
- Smaller-scale marine ecosystems based on geology, water depth, oceanography and biological communities (including species composition and diversity, trophic interactions)
- Used example of California kelp forests to provide details on ecosystem structure, function, services, and connectivity
- Highlighted importance of variation within ecosystem types, again using kelp forests as an example
- Control of sea urchin populations and their effect on kelp beds controlled by different species in different regions of California, although all are the same type of ecosystem
- Ended with description of ecosystem based management

Feedback:

- Would be good to include fly-over pictures of northern California kelp beds, both before and after beginning of sea urchin fishery in that region

- Turnover in kelp beds is on the order of 6-7 years, with physical disturbance playing much larger role in northern California kelp beds
- Could point out that the MLPA ahead of its time in thinking about ecosystem approaches to management
- List which habitats occur in which ecosystems
- Anticipate a question about why southern California fishery does not control urchin populations in that region.
- What aspects of ecosystems should the BRTF focus on when making decisions
- Resolve conflict between ecosystems as a fundamental unit and the idea that they can be considered at several spatial scales

Marine Habitats – Rikk Kvitek (lead) and Jeff Paduan

Main points:

- Marine habitats are as complex and diverse as terrestrial habitats and are important to species of interest.
- Habitat properties are determined by seafloor topography and surface type, oceanographic properties, and biogenic habitats.
- Habitat complexity creates patchiness, which promotes biodiversity.
- The MLPA defines specific habitats and considers depth zones, oceanographic habitats, and biogenic habitats.
- A lot of seafloor mapping has been done along the central coast and features include broad shelves, mudrock outcroppings, deep canyons, and Elkhorn Slough.
- Upwelling centers tend to be associated with headlands along the central coast. Upwelling is strongly linked to biological productivity. In addition, upwelling and relaxation cycles could serve as a mechanism to transport larvae offshore and onshore respectively.
- Computer animation was used to demonstrate variability of kelp beds in both space and time. Central coast kelp beds tend to be more continuous, more affected by winter storms, and less affected by El Nino than those in southern California.
- An example was provided of how habitat mapping was used in the Channel Islands MPA planning process to identify both MPA and control sites for evaluation purposes.
- Recommendations were presented for applying habitat knowledge to MPA network design.

Other potential slides to include could make the following points:

- Types and quality of data are patchy, but good proxies for areas lacking high resolution data
- Further details on kelp patch persistence over time

Feedback:

- The importance of habitats in MPA networks should be carried throughout the presentation or left out entirely. Perhaps this topic would be better suited to a later presentation to the BRTF.
- Presentation should mention differences between unique and representative habitats as listed in the MLPA and mention deep water biogenic habitats.
- Presentation should discuss how humans interact with habitats and how this affects species abundances.
- Explain why replicating habitats is necessary even though much of this will be included in the later talk on MPA design.
- Make the link between habitats and communities of species associated with those habitats.
- Point out variation within habitat types (e.g. more than one type of rock habitat).
- Change boundaries on the slide about the Channel Islands MPAs.

Use of Economic Data for the Design and Evaluation of MPAs – Linwood Pendleton (lead) and Astrid Scholz

Main points:

- Definitions of socio-economics and economic analysis
- Outlined three areas of importance
    1) Baseline economic data for areas that might be affected by MPAs
    2) Economic burdens of implementing MPAs
    3) Economic benefits of implementing MPAs
- Example of comparing the net economic value of an area with and without an MPA
- Total economic value includes direct uses (both consumptive and nonconsumptive), indirect uses (coastal protection, clean air, etc.), and value for non-users or future users
- Important to look at both market and non-market impacts
- Consider trade offs between a localized loss in restricted behaviors and restricted activities outside the MPA or unrestricted activities within the MPA
- Consider impacts inside MPAs on both fishing and nonconsumptive uses and impacts outside MPAs, such as spillover or refuge effects
- Key steps involve identifying what is at stake, what the likely impacts are of MPAs, and how to implement adaptive management

Feedback:

- Make explicit that identifying the stakes and likely impacts are required for adaptive management.
- Is there a way to provide examples of relevant data sets? Perhaps something from the Channel Islands process? More detail will also likely be given a later presentation.

- A suggestion was made to include cultural impacts, although this should be included in a later presentation.
- A summary slide could be included to mention other types of relevant data, such as the value of fishing heritage or infrastructure impacts on harbors.
- A concern was expressed that the presentation creates expectations for many data sets that are not likely to be collected. The MLPA does not require a cost-benefit analysis.
- Is it possible to talk about baseline data being collected on nonconsumptive uses, focus groups, and other datasets from the literature?
- Slides to compare the net economic value of an area with and without an MPA could be formatted differently to make the point clearer.
- Use the term "socioeconomics" instead of "economics".
- Discussion ensued about whether there is sufficient available socioeconomic data to make decisions.
- The presentation should highlight information useful for the BRTF as it evaluates MPA proposals.
- Think about putting the presentation in the context of the six goals of the MLPA. Goals 2 and 4 both mention value (economic and intrinsic). Talk about how economists assess these types of values.
- Consider the economic value of including different habitats in MPA designs.
- It is important to distinguish between net and gross values.
- Think about what data is available now or in the near future and how they might be useful.

A second draft of the presentation titled, *Use of Economic Data for the Design and Evaluation of MPAs* was given with many of the above comments incorporated as changes. The second draft was met with approval.

Presenters were asked to bring at least 20 copies of any documents they would like to provide, (e.g. summaries of key points and copies of presentation slides) at the July 12 BRTF meeting. Kvitek offered to bring large-scale data plots for the coastal region between Pigeon Point and Point Conception as a visual aid. Mary Yoklavich offered to contribute definitions to a glossary for the BRTF to aid in understanding of the presentations.

Draft List of Decision Framing Topics for BRTF

John Ugoretz opened this discussion by explaining that the goal of these presentations is to develop a series that works well conceptually and also fits in with what is going on in the MLPA Initiative process at the time.

Unit titles and SAT member participants are listed below. Also included is commentary by SAT members in brief discussions about units not presented at today's SAT meeting.

- Unit 1: Ecosystems and Ecosystem Services – Mark Carr (lead)
- Unit 2: Use of Economic Data for the Design and Evaluation of MPAs – Linwood Pendleton (lead) and Astrid Scholz
- Unit 3: Marine Habitats – Rikk Kvitek (lead) and Jeff Paduan
- Unit 4: The Importance of Big Old Rockfish (Population Persistence) – Rick Starr (lead), Steve Berkeley, Loo Botsford
    - Idea of individual replacement in a population should be included
    - Important for MPA design because it identifies how spatial regulation differs from traditional fisheries management
    - Should acknowledge previous work in fisheries management about reproduction and larval survival
- Unit 5: Larval Dispersal and Recruitment – Steve Palumbi (lead), Loo Botsford, Steve Gaines, Jeff Paduan
- Unit 6: Adult Movement – Rick Starr (lead), Mark Carr, Doyle Hanan, Steve Palumbi
- Unit 7: Consumptive and Non-Consumptive Uses in the Central Coast – Astrid Scholz (lead), Linwood Pendleton, Carrie Pomeroy
    - Suggestion by SAT member to include data such as fishing license sales and changes in human population growth as it relates to ocean use
    - Might want to include changes in fishing pressure through time
- Unit 8: MPA and Network Design – Steve Gaines (lead), Loo Botsford, Mark Carr, Ray Hilborn, Steve Palumbi, Jim Wilen
- Unit 9: Monitoring and Evaluation – Mark Carr (lead) and Jenn Caselle
- Species of Interest and their Ecological Interactions – Steve Murray, Rick Starr, Mary Yoklavich, and potentially Richard Parrish
    - Lead to be determined after the subgroup meets
    - This talk likely linked with Unit 4

Leads of presentation units will coordinate with Adina Abeles of COMPASS and Satie Airame of PISCO to refine presentations.

Units 1, 2 and 3 will be presented at the BRTF meeting on July 12, 2005.

Draft presentations of units 4, 5, 6 and 8 will be given at the next SAT meeting. Times and locations for the final presentations to either the BRTF or CCRSG will also be determined at that time.

Future Meetings

In the absence of volunteers for a permanent executive committee to assist SAT Chair Steve Barrager, John Ugoretz announced that he would consult with individuals on developing agendas for future SAT meetings as needed. In addition, it is recommended that a SAT

member other than the chair be present at all BRTF meetings to both represent and relay information back to the SAT.

The SAT decided meetings for the rest of 2005 would alternate between San Luis Obispo and Santa Cruz according to the following proposed schedule:

- Tuesday, August 2, 2005 – Santa Cruz
- Tuesday, August 30, 2005 – San Luis Obispo
- Monday, September 19, 2005 – Santa Cruz
- Tuesday, October 18, 2005 – San Luis Obispo
- Tuesday, November 15 – Santa Cruz

Exact locations of meetings to be determined.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Tuesday August 2, 2005
9:00 a.m. - 5:00 p.m.

Elihu Harris State Building, Room 10
1515 Clay Street, Oakland, CA 94612

This meeting will be videotaped for future viewing on the internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives
- *Review and adopt Master Plan Science Advisory Team (SAT) guidelines*
- *Report on progress of species list and proposal evaluation sub-teams*
- *Review and discussion of questions from Stakeholder Group*
- *Review draft presentations to the Blue Ribbon Task Force*

9:00 a.m. **1. Welcome and review of agenda**
Steve Murray, Acting Chair, Master Plan Science Advisory Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA / Nearshore Ecosystem Coordinator, California Department of Fish and Game

9:10 a.m. **2. Revised SAT Guidelines** – *John Ugoretz*
A. Review and discuss revised SAT guidelines
B. Revisit executive committee concept
C. Adoption of the guidelines postponed to August 30 meeting.

9:45 a.m. **3. Report from Species List Subteam** – *Doyle Hanan*
A. Brief report on progress of team and update planned process
B. SAT discussion

10:15 a.m. **4. Report from Proposal Evaluation Subteam** - *Astrid Scholz or designee*
A. Brief report on progress of team and update planned process

10:45 a.m. **5. Definition and Examples of Rare Unique Habitats**
A. Discuss concept and review recent information - *John Ugoretz*
B. SAT action and/or establishment of subteam

11:15 a.m. **6. Draft Presentations for the Blue Ribbon Task Force**
A. Sustainability and Old Fat Females – *Loo Botsford*
B. Larval Dispersal and Recruitment – *Mark Carr*
C. Adult Movement and Neighborhoods – *Rick Starr*

12:30 p.m. **Lunch** - Please be prepared to purchase lunch at nearby restaurants

1:30 p.m. **6. Draft Presentations (cont.) and Discussion**

D. Sustainability and Old Fat Females – *Loo Botsford*
E. Larval Dispersal and Recruitment – *Mark Carr*
F. Adult Movement and Neighborhoods – *Rick Starr*
G. Preliminary discussion of Network Design presentation
    a. Water Quality and Design - *Ken Schiff*

3:45 p.m. **Break**

4:00 p.m. **7. Update on Central Coast Stakeholder Group and Questions** – *Mark Carr*

A. Review of results of meeting
B. Review questions from the stakeholder group and potential answers
C. Review of initial regional goals and objectives - potential subteam

4:45 p.m. **8. Wrap up and Public Comment**

Public comment will be limited to time available at the discretion of the SAT chair.

5:00 p.m. **Adjourn**

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
AUGUST 2, 2005 MEETING SUMMARY
Elihu Harris State Building
1515 Clay Street, Room 10
Oakland, California

SAT members present: Loo Botsford, Mark Carr, Doyle Hanan, Steven Murray (acting chair), Jeff Paduan, Kenneth Schiff, Astrid Scholz, Rick Starr, William Sydeman, Mary Yoklavich

SAT members not present: Steve Gaines, Rikk Kvitek, Steve Palumbi, Kevin Piner, Dave Schaub, Susan Schlosser, Dean Wendt, Richard Young

Others present: Heather Galindo (note taker; SAT support staff), Dr. Mary Gleason (MLPA staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), Paul Reilly (DFG staff), John Ugoretz (DFG staff) and approximately seven members of the public

Acronyms used: California Department of Fish and Game (DFG); geographic information system (GIS); marine protected area (MPA); MLPA Blue Ribbon Task Force (BRTF); MLPA Central Coast Regional Stakeholder Group (CCRSG); MLPA Central Coast Science Sub-Team (CCSST); MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT)

Introduction

Steve Murray, acting chair for the meeting, welcomed the SAT, members of the MLPA Initiative staff and the public.

Steve Murray and John Kirlin thanked everyone for being present and for all their work between meetings. John Kirlin noted the success of the recent science presentations to the BRTF, which he characterized as informative and well received. John reinforced the credibility of and trust placed in the SAT by the MLPA Initiative staff and BRTF. He noted that the same three presentations will be given at the next CCRSG meeting. The CCRSG has gained a great deal of momentum though it still faces significant challenges. CCRSG members have been generating requests, questions, and concerns for the SAT. A process for responding to these requests and questions has been established. More on this process to follow.

John Ugoretz reviewed last meeting's action items:

- SAT guidelines – revised version was not completed between last meeting and this one. Carrie and Heather will receive comments and edits so that it may be finalized at the September meeting.
- Species likely to benefit subteam will present its progress today.
- Presentation topics – Carrie Pomeroy was invited and will get back to us on whether she can participate. Draft presentations 4, 5, and 6 will be heard today. Presentation 8 has been put off until a later date.
- Upcoming meetings are from 9 a.m. to 5 p.m. unless otherwise noted:
    - August 30, San Luis Obispo

- September 19, Santa Cruz
- October 18, San Luis Obispo
- November 15, Santa Cruz

Revised Science Advisory Team Guidelines

SAT members discussed the latest version of the SAT guidelines document; they were directed to send revisions to Heather and Carrie, who will work with Steve Murray to produce a new version for final SAT approval.

Recent updates to the document include:

- A new paragraph on the process of reviewing and prioritizing questions and data requests, included under the section on working with the CCRSG (paragraph 2);
- A new paragraph on the role of an executive or planning committee, which will be created in the near future, and the SAT chair.

Suggestions from SAT members included:

- The need for a core group of people who are willing to take turns attending BRTF meetings and representing the SAT; for the next few meetings, the SAT members who are giving scientific presentations to the BRTF will cover this role;
- The need for a SAT executive or planning committee to work with John Kirlin, John Ugoretz, Mike DeLapa and Mike Weber on agenda-setting, prioritization and delegation of tasks, and to provide counsel and chair meetings;
- Creation of a more formal communication structure (with a spokesperson(s)) for dialogue between the BRTF and the SAT to be implemented when proposal review and evaluation begins in the fall;
- Alteration of the language around the SAT's responsibility for responding to questions and information requests to reflect the fact that SAT members will only be asked to respond to those questions that have been flagged as requiring SAT attention via an MLPA Initiative staff/CCSST filtering process.

Other issues that were discussed included:

- The process for reviewing recommendations of the CCRSG: John Ugoretz explained that the intent is for the SAT to review and rate alternative CCRSG proposals for MPAs, based on pre-determined evaluation criteria. The BRTF will then take those ratings under consideration when it makes its final recommendation. Doyle Hanan and Ken Schiff offered to work on clarifying the section of the document dealing with this.
- The process for receiving and responding to questions: The central clearinghouse for stakeholder questions is the online comment/question submission form. All stakeholders should be directed to submit their questions there. Questions received online will go through the MLPAI/SST filtering process discussed below under the CCRSG meeting update.

Report from Species Likely to Benefit Sub-Team

Doyle Hanan reported on progress from the species likely to benefit subteam, which had been charged with reviewing the list of species likely to benefit from MPAs and ranking the species based on their likelihood to respond to protection via spatial management. The team discussed criteria for which species should be prioritized for consideration in the design of MPAs, but did not decide on a final list of criteria. Some suggested criteria include range size, habitat specificity, protected or evolutionarily significant unit (ESU) status, and fraction of lifetime egg production (FLEP) status. The team also discussed the issue of adding marine mammal and bird species to the list, but again has not made final decisions. Doyle asked that SAT members contact him with further input on the list and criteria.

Several ideas came out of the ensuing discussion. First, SAT members agreed that a preface should be created to accompany the list, explaining the basis for the proposed ranking of species. It should discuss what characteristics are shared by those species whose populations are likely to respond to spatial management via MPAs, giving examples of species from the central coast to illustrate. This document might also answer such questions as: Do we have higher certainty about the effects of MPAs on particular groups of species? If these species are going to benefit, what is required in terms of design and management particulars? And, what can we affect through spatial action?

Second, while most SAT members felt comfortable identifying some example species likely to benefit, they expressed reservations about making a comprehensive ranking of all species, given the lack of information on the biology and status of some. The final document will be crafted to reflect this uncertainty about the effects of MPAs on some organisms. It will include the preface, the highlighted list of priority species (about which there is relatively high certainty), and the full list as it exists now.

Third, it was suggested that the evaluation subteam and species likely to benefit subteam should coordinate their activities given that their products will need to dovetail eventually. This led to the more general idea of producing a flowchart or organizational chart that documents the interaction of work products and activities among the various SAT, CCRSG, and MLPA Initiative working groups and subteams.

John Ugoretz reported that students at UC Santa Barbara have been reviewing life history traits and stock status for species on the current list. This information will be available to the SAT before the next meeting. He also encouraged the subteam to contact non-SAT scientists for additional information about individual species. John reminded the group that the list has been limited from the beginning to species that are taken by fisheries either directly or indirectly, and he encouraged them to be very explicit about why they have added new species if they choose to add bird or mammal species to the list.

Report from Proposal Evaluation Sub-Team

Astrid Scholz gave an update on progress of the proposal evaluation subteam, (Astrid Scholz, Steve Gaines, Steve Palumbi, Loo Botsford, Jeff Paduan, Kevin Piner, Mary Gleason), that had been charged at the last meeting with reviewing the template for proposals, considering approaches to and draft criteria for MPA designs, and reviewing potential tools that might be useful in the evaluation process. The team members met over lunch at the last SAT meeting to brainstorm infrastructure and analytical needs. They developed a draft proposal for needs for staff support and resources. The proposal lays out a framework for a potential decision support tool to be developed and used by the SAT in evaluating proposals and suggests funding for a dedicated GIS analytical staff person, some work to be done in the Botsford lab, and additional work to be done to advance the science and understanding of zonal management and the potential impacts of different levels of protection. Loo Botsford, Steve Gaines, and Astrid Scholz are currently listed as principal investigators on the proposal, which is pending with the MLPA Initiative. The team has not yet discussed the first two items, reviewing the template and considering criteria for MPA design.

The SAT discussed the proposal at length. A number of concerns were raised, including the potential perception by outsiders that the SAT has given charge to a small group of people to develop a proposal to support their own work. The order of priorities within the committee was also questioned as some wondered whether evaluation criteria should be developed first, before evaluation tools, as the choice of criteria might influence the choice of tools. Some SAT members also expressed discomfort with not having had a thorough discussion of the pros and cons of various tools before this proposal was developed. SAT members expressed general concern that they weren't being more broadly involved in the development of criteria for evaluation and the design of tools.

John Ugoretz emphasized that the sub-team had done what was asked of them by outlining what they needed to support their work. He also noted the importance of getting tool development started as soon as possible because of the rapid pace of the process.

John Kirlin explained that the task of the evaluation sub-team included both reviewing the template for proposals, and developing and reconciling criteria for proposal evaluation, which would be entering in two streams, one from the CCRSG in the form of goals and objectives, the other from the various recommendations of the SAT – in the MPF, the species of concern rationale, documents of the evaluation subteam, etc. These criteria need to be brought into alignment so that they are not conflicting. The evaluation tool idea came out of this task of reconciling the various criteria.

John Kirlin indicated that a simpler data visualization tool to support the work of the CCRSG is being developed under contract and is in draft form now, but is unlikely to meet the needs of the SAT. Most of the GIS capacity for this project is housed at UCSB and is available to the SAT and to anyone else via internet map service (IMS). GIS is primarily an inductive tool, data and experience driven. A deductive tool, e.g. something like MARXAN, might also be useful to allow us to look at sets of data and judge the effects of different alternative proposals. MLPA

Initiative staff decided to support use of such tools for the MLPA process over the long run, though they may or may not be available in time for central coast decision-making. In order to make this happen, we have to identify the need, identify people who can make it happen, and commit funds. The Resources Legacy Fund Foundation board has eight decision windows a year and they are meeting this week. MLPA Initiative staff asked for a proposal they could submit at this time to earmark funds for development of a potential deductive tool. A broader discussion now of the evaluation process, the criteria, and the work plan will definitely inform the sort of tool needed.

The sub-team will meet again via conference call(s) between this and the next meeting and develop a presentation to be delivered to the whole group on draft evaluation criteria and the pros and cons of various spatial analysis tools that could be applied to evaluation. Following the presentation there will be an opportunity for a substantive discussion of these issues by the whole SAT.

Definition and Examples of Rare and Unique Habitats

John Ugoretz reported that the question of what constitutes a rare or unique habitat in the central coast had come up in staff discussions with scientists and with constituents on the CCRSG. John asked the SAT for further guidance on how rare and unique habitats should be defined and how this definition might impact MPA design.

As with rare species, rare habitats are those that have either limited abundance or a restricted distribution. The SAT discussed how spatial scale impacts rarity (e.g. rocky intertidal might be rare if you consider the southern California region, but not rare if you consider its distribution within the intertidal zone of the whole state). They recommended that the rarity of any given habitat (i.e. its level of representation) be assessed at three spatial scales: within the state, the biogeographic region, and the depth zones outlined in the MPF. For example, depending on the spatial scale, nearly every habitat but sand bottom might be considered rare in some areas. In particular, pinnacles, estuaries, canyon heads and the rocky intertidal might be considered under-represented at some scales.

The SAT requested that Mary Gleason and her team produce a matrix of the abundance of each of the defined habitat types by depth zone in order to identify the relative area within each habitat at both state and regional levels across different depths. Though this will be difficult for some habitats for which there are not currently statewide data in the regional profile, Mary reported that it should be possible for most habitats.

Mary Gleason requested that the SAT provide some guidance for CCRSG members on how to think about rare and unique habitats and also on what might constitute areas of biodiversity significance. There was some discussion about how best to do this, either starting from scratch or borrowing from efforts at The Nature Conservancy and other NGOs and agencies where prioritization of sites based on their rarity or contribution to biodiversity is a regular activity.

The question of what constitutes a unique habitat was more difficult to define, since uniqueness of a habitat may only be meaningful in reference to a particular species that depends on that habitat or a particular ecosystem function it provides. In addition, uniqueness may derive from non-biological characteristics (e.g. educational uses, aesthetic values, etc.). SAT members recommended that any alternative proposals for MPAs that depend on the definition of a given habitat or site as unique for its inclusion in their proposal should contain a description of why they have considered that habitat or site unique.

Outcomes:

1. Mary Gleason will develop a matrix of the relative abundance of each of the different habitat types (from MPF) by depth zone for each of the biogeographic regions and the state as a whole.
2. As guidance when considering relative uniqueness of habitats, proposals should consider statewide and regional distribution as well as distribution across depth zones.
3. The SAT recommends that the CCRSG include a description of the criteria used to classify particular habitats as rare or unique in any alternative proposals developed.

Draft Science Presentations for the BRTF and CCRSG

Three draft presentations were delivered to the SAT for comment:

1. Sustainability and age structure in marine populations;
2. Larval dispersal and recruitment; and
3. Movements of marine species.

A brief summary of their content, followed by an outline of any major points of discussion, is included below for each presentation. The final annotated presentations will be available on the MLPA website in the future. The SAT also discussed a potential future presentation on water quality that is yet to be developed.

Sustainability and age structure in marine populations – Loo Botsford (lead)

Main Points:

- MLPA goals ask us to sustain populations and design and manage MPAs to the extent possible as a network.
- *Sustainability:* By definition, in sustainable populations, individuals replace themselves. Mortality rates for fish eggs, larvae and juveniles are very high. In order to have a sustainable population, adult fish must produce enough eggs so that a juvenile will survive to replace each adult.
- *Effects of fishing on age structure:* In order to maintain that level of replacement, we must account for effects of fishing on the population. Main effect of fishing is to shorten the age structure or to remove large individuals.

- *Lifetime egg production:* Measure current sustainability by calculating lifetime egg production (LEP). Fishing reduces LEP by removing older females. When LEP falls below a certain threshold (35-60%), the population collapses.
- If there are MPAs where fishing is prohibited for a given species, some of the larvae will go into reserves, others, into fished areas. The basic requirement for sustainability for a population in an area must be 35-60% of natural settlement.
- Some species show evidence of a shift in age structure since the 1980s and a decrease in LEP, sometimes to below the threshold at which the population can be sustained.
- *Young rockfish do not reproduce as well as old rockfish*: New data from Steve Berkeley add another wrinkle to this story. Berkeley has found that larvae of black rockfish have different survival rates. Larvae of young fish have poorer survival than those from older, larger mothers. Larvae of older females have a larger stored oil globule, therefore they resist starvation longer.
- *Implications for conventional fishery management*: As fishing pressure increases, LEP declines. If we include variation in larval survival due to variation in the age of mothers in the populations, we can get a revised estimate of lifetime larval production under fishing. This produces a lower line, or a larger impact of fishing.
- *Implications for reserves*: To achieve the same level of sustainability for a given population, you need either less fishing between reserves or larger reserves.

Feedback:

- Anticipate a question about whether blue rockfish populations are really declining. It looks from the graph like they've been stable at 35% LEP.
- Females produce 100s of 1000s or millions of young. Make the point on the life cycle slide that they do that year after year and live to be pretty old. Also make the point that fecundity increases with age. Make it clear that most eggs and larvae don't make it.
- Explain why it takes a while for populations to collapse.
- The result that larvae from older mothers have higher survival may likely be universal, but these are new results that remain to be tested on other species.
- If you had the same shortened age structure, but you had successful cohorts of younger fish coming through, would that affect LEP? Loo's answer: Yes. Strong year classes will impair our ability to successfully estimate LEP. You need to describe LEP in a different way if you have strong year classes. Another potential issue with these datasets is that they are fisheries dependent and you will have more young fish in them over time because people become more likely to keep younger fish through time.
- Summary slide – think about rewording point 6 to make it slightly less explosive to an audience that will hear the "theory of larval dispersal" being invoked to advocate for less fishing or more area in reserves.
- How universal is the 35-60% threshold across different species? Can the threshold be raised by ameliorating environmental effects on them? Loo's answer: Thirty-five percent comes from the slope of the recruit-egg production curve at very low numbers, from analyses of collapsed populations.

- Explain the ways in which MPAs are equivalent to a reduction in fishing effort. For example, do MPAs result in a more natural size distribution? Loo's answer: In simulations, we always find you can get the same yield out of conventional fisheries management as out of reserves. Don't think it's been convincingly shown that you can do anything differently with MPAs.

Larval dispersal and recruitment – Mark Carr (lead)

Main points:

- Larval dispersal is important because: (1) Larvae replenish marine populations; (2) Larvae disperse individuals and genes among populations; (3) Larval dispersal has implications for the design of MPAs.
- Vast majority of fishes and invertebrates produce larvae that are adapted for life in the pelagic environment. Therefore they are transported away from the parent populations. This leaves the adult populations dependent on larval transport from elsewhere back into the population.
- Most invertebrates and fishes, most fished species, mature fish of all sizes, and both mobile and sessile species produce larvae.
- How far and in what direction they disperse depends on:
    - Timing of release (birth)
    - Time spent drifting in the ocean
    - Direction and speed of ocean currents
    - Behavior of larvae
- For a suite of western North American coastal fishes, the average time spent in the larval stage is 94 days, based on rings in ear bones (otoliths). Majority of reef fish spend 1-3 months in plankton. Most invertebrates have a shorter pelagic larval duration. The majority are in plankton for <1 day, nearly all for <1 month.
- Using a variety of different methods (otoliths, statoliths, oceanographic modeling, and genetics) we find similar results: many invertebrates exhibit dispersal distances on the order of 5-100km, fish – 20-200km.
- *Time as larvae versus dispersal distance*: Data on known larval distances and dispersal distances are plotted and compared to the expected relationship given passive dispersal and average current speeds along the west coast. Larvae are not going as far as we would expect based on passive dispersal, and instead must be doing something to reduce how far they are dispersed by currents.
- *Conditions for larval settlement and recruitment:* Mid-water rockfish recruit during cold, nutrient-rich water, during upwelling periods. Benthic rockfish appear to recruit during warm water periods between upwelling periods.
- *Variation from year to year:* Mid-water rockfish recruit better during La Niña years (cold water, strong upwelling). Benthic species recruit better in El Niño periods (warm water, reduced upwelling). Both experience intermediate recruitment during intervening years.
- Implications for design of MPAs:

- Individual MPAs are likely to protect species with dispersal distances similar to the length of reserve (i.e. short dispersers).
- Larger MPAs are likely to sustain populations of more species.
- Larvae of some species will disperse beyond boundaries into surrounding areas.
- The magnitude of contribution to surrounding areas depends on size of the MPA relative to the surrounding area, time the MPA has been protected, and the intensity of historical fishing.
- Spacing of MPAs – to contribute to an effective network, MPAs should be placed at distances that allow exchange of larvae between MPAs.
- MPAs located in retention areas are more likely to retain and receive larvae than other areas along the coast.
- MPAs located in upwelling areas are more likely to export larvae to other areas along the coast.
- Networking of MPAs – populations may be sustained even for species whose larvae and adult dispersal exceeds size of MPA if populations are protected in multiple reserves close enough together to be connected by dispersal of larvae.

Feedback:

- Spacing graphic – need to acknowledge and make clear the contribution of young from outside to inside as well as inside to outside. Mention the assumption of 20-25% LEP outside.
- Make clear that the model does not make predictions based on specific oceanography or geography, but rather just assumes diffusion of larvae away from the source and makes predictions based on the fact that larvae disperse different distances. In addition, the empirically measured dispersal rates already include upwelling, eddies, and other oceanographic processes that impact effective dispersal distances.
- There was discussion about whether we have enough information to know whether it's advisable to put an MPA in or out of a retention zone. This may be a higher order question. However, in the SAT recommendations, the diversity in export probabilities represented by different oceanographic zones was considered habitat diversity that must be replicated in MPAs. Oceanographic variation is likely important, but true retention zone are likely to be sinks which do not contribute to production, so we may not want to recommend replicating MPAs within them.
- There was discussion about whether or not to use the model of dispersal effects on reserve design at Point Reyes. In general, a larger scale model of Monterey Bay was considered a better choice because it was less subject to questions about the particular geography and oceanography of the coastline and was likely to be less contentious.
- How much larval export goes to other regions will also be affected by the shape of the reserve (i.e. the ratio of boundary to area).
- Can we include more information about the tradeoffs decision-makers might be making when they consider this information? This could be choices like do we use oceanographic models or stochastic models, models based on LEP, genetics, etc.? Can

we give them something more than just that it's better to put the reserves closer together? Mark's answer: I think the dispersal estimates based on the tools we have to date are the best we can give them right now. The oceanographic tools we have currently are not accurate enough or comprehensive enough to use them for MPA siting up and down the coast. We're forced to fall back on average dispersal distances and the variation in those distances among species to make siting and spacing decisions.

- This might be a good place to tie things in with species likely to benefit, if we can think about their dispersal distances when thinking about rebuilding populations.
- Will having models moving propagules around hurt us if we are trying to fight for acceptance of the "theory" of larval dispersal?

Movements of marine species – Rick Starr (lead)

Main points:

- Species move to seek shelter, food, and reproduction. Types of movements are related to growth. They occur over different temporal scales – daily to monthly, seasonal, annual or decadal. Information on adult movements comes from fishing, direct observation, acoustics, tagging, genetics, and ocean current data. This talk focuses on how far non-planktonic adult and subadult animals move (primarily those with movements from 0-100km) and how that relates to MPAs.
- We only know much about patterns of movement for a few dozen fish species. Most of what we know comes from external tagging data.
- An MPA will protect some individuals whose entire home range is inside the MPA, but others will only be protected part of the time because their home range extends beyond the MPA. Level of protection depends on time spent in versus out, distance they travel, behavior (e.g. frequency of movements, desire to eat), the amount of fishing outside the reserve (especially at edge), and the lifespan of the fish.
- *Yield*: With a reserve, some of the individuals move in and out of the reserve, reducing their chances of getting caught, increasing their chances of surviving to larger age classes. End up with larger individuals in the reserve. Yield in fisheries outside depends on how much fish move back and forth, relative contribution of eggs from adults within reserve, how much area is in reserve and where.
- We still don't know what role an MPA will have for highly migratory species. We don't know the importance of genetic contribution from individuals that stray long distances.
- The SAT recommends MPAs 5-10km long to encompass the home ranges of many species. Many deeper water species may need to move further as they move among more widely dispersed deep water habitat patches, thus we recommended a wedge shape.

Feedback:

- There was some discussion about the wedge recommendation, which may conflict with DFG recommendations around shapes that are easily enforceable and understandable by the public. Because it is a science-based recommendation, though, consensus was

that it should be included, but that a comment about the trade-off with enforceability could be added as well. The wedge comes partly from evidence that some shallower dwelling species have smaller home ranges than deep species, though this is based on a small subset of all species. In shallower water one may be able to get away with a smaller reserve while in deeper water a larger reserve is needed.

- Emphasize that we're focused on the shorter dispersal distance species. We've said the long-dispersing adults aren't protected by MPAs, but perhaps it's just a proportionate protection of a diffuse distribution?
- We might recommend that specific habitats be protected to help protect highly migratory species, e.g. birds in estuaries. Guidelines say that protecting areas that connect among habitats is critical. Protection of MPAs that encompass multiple habitats will both protect species that move among different habitats and achieve representation.
- You could tie this to previous talks by showing the effect on LEP instead of yield. If a reserve provided a certain decrease in fishing mortality for sedentary species, then species with more movement would have less protection and a decreased benefit in terms of LEP.
- Might want to discuss the relationship between size and configuration of habitat relative to size and shape of MPA (e.g. fish will have different chances of moving out of a long linear patch partly in the MPA versus a round patch entirely encompassed by the MPA).
- A major concern is that this information is limited to 10-15% of species. How does this correspond with the species of concern list? Do we have better information about the species that we're concerned about (those on the shorter end of dispersal scale)?

Water quality and design

John Ugoretz opened a discussion on how considerations of water quality might impinge on MPA design. This was proposed as the subject for an additional unit in the science presentations series. The discussion was led by Ken Schiff.

Ken framed the issues in terms of three questions:

1. Is it safe to swim?
2. Is it safe to eat the seafood?
3. Is the ecosystem protected?

Ken posed these questions in order to think about how they might impact MPA design. For example, if an MPA has as a goal the improvement of recreational opportunities, might you want to consider water quality for swimmers as a criterion for its siting?

The group discussed whether and how these questions relate to MPA design. Other questions that might be relevant to design are: What is the status of water quality in central California? Is it improving or getting worse? Are there hotspots for concern?

There was discussion about how an MPA could impact water quality, whether by some special provisions for input or other mechanism. A few examples were offered. Establishment of MPAs on the Great Barrier Reef led to a large movement to control water quality on land in adjacent areas. Areas of special biological significance (ASBS) have associated regulations about discharges. Strategies might include either avoiding putting MPAs in areas where water quality is so poor that it will impair ecosystem health or nonconsumptive use, or putting an MPA somewhere you want increased attention or action around water quality.

John Ugoretz reported that the Fish and Game Commission does not have the authority to restrict the introduction of pollutants into an MPA, but the MLPA does bring up these issues for consideration. The BRTF is interested in hearing about these and other issues that might be regulated under other processes or jurisdictions.

Establishing MPAs may afford an opportunity to test the hypothesis that populations are small because of adverse water quality versus fishing, because an MPA can control fishing effort, but without special provisions, will not control water quality. We know that the status of resources is declining. If we think water quality might be related, then we need to know if water quality has also been declining.

Much of the discussion focused on the third question about ecosystem protection. The question was posed whether the SAT wants to consider the other two. Some argued that human health and safety considerations should be included because of the interest of stakeholders and nonconsumptive users.

Maps exist of vulnerability or risk from the introduction of pollutants, which should be taken into account. Variation in pollution will reflect spatial variation in human use along coast – information that will be useful for multiple purposes. Mary Gleason reported that the regional profile already has a lot of information on water quality including written descriptions, web sites, mapped beach closures, known impaired sites, ASBSs, etc.

John Ugoretz noted that outside expertise can be called in on this issue if the SAT would like to involve experts who know more about water quality issues in the central coast region.

Ken Schiff outlined a potential presentation on water quality issues and MPA design that he will develop. Building from his three initial questions (listed above), the talk will cover sources, fates and effects of pollutants and relate these to design recommendations.

Additional topics that were suggested for inclusion:

- Larval entrainment in power plants;
- Classes of toxins, reasons each is dangerous, relevant levels, fates, maps of spatial distribution/hotspots for each;
- Design implications of these maps and temporal trends in pollutants.

Scheduling

The first three presentations are scheduled for the August 10, 2005 CCRSG meeting. Scheduling of the three latest presentations for the CCRSG will happen outside the meeting; they will be presented to the BRTF at its September meeting.

Update on CCRSG Process and Questions

Mark Carr provided an update on activities of the CCRSG and CCSST. During the last CCRSG meeting, the regional profile, regional goals and objectives were discussed, Charlie Wahle (NOAA National MPA Center) presented on the monitoring of MPAs, and there were a variety of work groups that met during the second day. A process was developed to deal with questions that arose for the SAT. Mark had hoped to summarize questions during the meeting, project them for transparency's sake and ask stakeholders to review and confirm them. However, it turns out there is not enough time during the meeting for this. As an alternative, the note takers and CCSST leads will meet and clarify questions at the meeting then pass them onto Rita Bunzel who will compile them in a spreadsheet. There will then be a conference call involving key MLPA staff, CCSST gatekeepers plus any other interested members of the CCSST, Heather, and Carrie. The goals of the conference call are to (1) prioritize questions based on clarity of question, relevance to the CCRSG effort, and ready availability of information; (2) divide up questions among SAT and MLPA Initiative staff (may need additional support staff for this); and (3) identify particular individuals or groups to help answer those questions. Rita will then re-summarize these priorities and tasks and send them back out as a spreadsheet.

Mark Carr indicated that questions that arise outside of CCRSG meetings will be submitted via the website and then will be directed through this same process – review by conference call, prioritization, assignment, draft response, review, and posting of final responses. This is the process that was followed for the July meeting and it seems to be working. Though it was not sent out in July, the spreadsheet of questions will be sent to the whole SAT in the future. Responses to the questions will be posted on the MLPA Initiative webpage.

Mark reviewed the spreadsheet, sharing some specific questions and the process for prioritizing and answering them. Many of the questions were related to the regional profile. Others were more general scientific questions. Another set were primarily socioeconomic questions that were submitted by Jay Elder, but which came out of the socioeconomic working group of the CCRSG.

The primary questions or requests that arose in July for the SAT to consider were:

1. Develop a review process to assess data quality and objectivity in the regional profile;
2. Relate the data included in the regional profile directly to the design process;
3. What is the appropriate baseline and historical context for MPA goal and objective setting;
4. An eelgrass dataset is available for the state; and

5. The Marine Interests Group out of Morro Bay is gathering relevant information of which the SAT should be aware

A number of other questions were submitted after the July meeting and have not yet been formally reviewed, but several of them may end up being directed toward the SAT. In addition, there were a large number of economic questions that have so far been directed to Linwood Pendleton for prioritization. After that, some of these may come to the SAT. A process for addressing all these questions must be devised. Mark Carr suggested the evaluation sub-team should address the third question above. Others may be tackled by the whole SAT in an upcoming meeting.

Mark Carr stated that the SAT will have a chance to review the responses to scientific questions that are generated by staff or SAT members. John Ugoretz emphasized that responses crafted by the staff will not be characterized as “SAT responses” even if reviewed by the SAT.

One question that arose in the SAT discussion of the information request process was whether questions can be pre-filtered and digested in the work groups before they come to the SAT, so that requests do not come from individuals but from the groups. John Ugoretz responded that the process devised so far allows for openness and fairness, while at the same time allowing staff to prioritize among questions and keep the volume manageable. He did not feel that the individuals in the workgroups would be able to agree on what were the key questions.

It was suggested that the spreadsheet that details the question response process be published on the web so that stakeholders can see how questions are progressing.

Mark Carr also reported that a definitions document (e.g. for terms such as ecosystem structure, connectivity, networks, etc.) has been developed, relying on statutory language and published literature. The definitions will be distributed to the CCRSG shortly. Steve Murray noted that the MPA Federal Advisory Committee’s document is out now and it also has a glossary that might be useful.

John Kirlin reported that there are three standing working groups within the CCRSG: goals and objectives, mapping, and socioeconomic concerns (formerly data scoping group). Kirk Sturm is now chairing the socioeconomic working group and Astrid Scholz is acting as a CCSST representative to the group. Linwood Pendleton should be encouraged to participate with this working group (Astrid will invite him).

John Ugoretz distributed the CCRSG’s recommended provisional goals and objectives document and a spreadsheet delineating the rationale behind each of the objectives, references to supporting data, design considerations that each might impact, and potential indicators that you might use to determine if that objective is being met. They intend to adopt the goals and objectives at the next CCRSG meeting. At the next meeting the SAT should conduct a full review of the final version of the CCRSG goals and objectives, which will be

distributed when available. These will become an important part of the template for proposals and the evaluation process.

Public Comment

Karen Garrison (Natural Resources Defense Council) recommended qualifying the final statement in Loo Botsford's presentation because though fisheries management and MPAs may be equivalent in terms of yield or rebuilding populations, they are not equivalent in terms of other goals of the MLPA, including protecting natural diversity and abundance, structure and function of ecosystems, marine natural heritage, opportunities for recreation in undisturbed areas, etc.

Action Items

- SAT guidelines document
    - Steve Murray, Heather Galindo and Carrie Kappel will revise it based on comments received so far, by August 12.
    - Steve Murray will work on the executive committee section.
    - Doyle Hanan and Ken Schiff will work on the section on reviewing CCRSG recommendations.
    - Comments will be due back by August 18.
    - A final draft will come back out to the SAT on August 23.
- Species likely to benefit sub-team
    - Doyle will set up a conference call for the week of August 8 to discuss the issues that have come up (to include Mary Gleason, Paul Reilly, John Ugoretz, John Kirlin, as well as sub-team members).
    - Steve Murray will provide input on seaweed species.
    - John Ugoretz will send out the life history trait review by Bren School students as soon as possible.
    - The group will come to a decision and bring a first draft of criteria for ranking species to the next meeting (August 30).
- Proposal evaluation sub-team
    - Will set up conference call for the week of August 8 to start working on draft criteria and review the CCRSG provisional goals and objectives.
    - Sub-team will present to SAT on August 30 on draft criteria and on the proposed tools for evaluation.
- Rare and unique habitats: Mary Gleason will develop matrix of the relative abundance of each of the different habitat types (from MPF) by depth zone.
- Water quality presentation: Ken Schiff will draft presentation for September 19 meeting.
- Literature needed for SAT guidelines for design included in MPF. Mark Carr will coordinate with John Ugoretz. Needed before August 5.

Agenda Items for Next Meeting

1. Approval of finalized SAT guidelines
2. Discussion of draft rationale for prioritization of species likely to benefit
3. Presentation from proposal evaluation team, discussion of draft criteria for evaluation
4. Review of CCRSG goals and objectives
5. Review of CCRSG questions to SAT and potential responses

Upcoming Meetings

The next SAT meeting will be on August 30, 2005 in San Luis Obispo.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Tuesday August 30, 2005
9:30 a.m. - 4:30 p.m.

Ludwig Community Center
864 Santa Rosa Street
San Luis Obispo, California 93401

This meeting will be videotaped for future viewing on the Internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Review and adopt Master Plan Science Advisory Team (SAT) guidelines*
- *Discuss prioritized list and criteria for inclusion of central coast species likely to benefit*
- *Discuss criteria, process, and tools for MPA evaluations*
- *Review and discuss draft provisional Central Coast Regional Stakeholder Group (CCRSG) goals and objectives*
- *Review and discussion of questions from CCRSG*

9:30 a.m. **1. Welcome, review of agenda, and recent updates**
Steve Barrager, Chair, MLPA Master Plan Science Advisory Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, DFG
i. Adopted Master Plan Framework (MPF)
ii. SAT guidance and peer review of recommendations

10:00 a.m. **2. Revised SAT Guidelines** – *Steve Murray*
A. Review and discuss revised SAT guidelines
B. Adopt guidelines

10:30 a.m. **3. CCRSG Regional Goals and Objectives** – *John Ugoretz*
A. Review current list of goals and objectives
B. Discuss measurability of objectives
i. Potential indicators for monitoring
C. SAT guidance for CCRSG completion of goals and objectives

11:30 a.m. **4. MPA Evaluation** – *Astrid Scholz, Mary Gleason, John Kirlin*
A. Overview of the evaluation role of the SAT for existing and proposed MPAs
i. SAT guidance in MPF
ii. Goals and provisional objectives from the Central Coast Regional Stakeholder Group
B. Review lessons from Channel Islands and other experiences
C. Review draft criteria to evaluate MPAs and proposed packages.
i. Approach OK? Anything omitted? Extra?
ii. What more is needed? Indicators?

12:00 p.m. **Lunch** – Please be prepared to purchase lunch at nearby restaurants

1:00 p.m. **4. MPA Evaluation – Continued**

D. Discuss how to handle issue of networks in evaluation
    i. What dimensions of network? How to assess?
    ii. Further work needed on clarifying concept of network?
E. Assess current tools for evaluation, including IMSG tool
F. Review preliminary evaluation of existing MPAs
    i. How to incorporate information from SAT members with specific knowledge of existing MPAs?
    ii. Approach OK? Anything omitted? Extra?
    iii. What more is needed?
G. Discuss and act on possible tools to assist evaluation, including those proposed by SAT members

2:00 p.m. **5. Species Likely to Benefit List** – *Doyle Hanan*

A. Presentation of proposed list and criteria
B. Species/habitat relationships and impact on MPA design
C. SAT discussion and timeline for completion

2:45 p.m. **Break**

3:00 p.m. **6. Request for SAT contributions to CCRSG Regional Profile** – *John Ugoretz, Mary Gleason*

A. Assistance in completing high priority areas (e.g., oceanographic features)
B. Assistance in developing a data quality review process
C. SAT volunteers to read the profile and identify possible misstatements

3:30 p.m. **7. Update on Central Coast Stakeholder Group and Questions** – *Mark Carr, Dean Wendt*

A. Review of results of meeting
B. Review questions from the stakeholder group and potential answers

4:00 p.m. **8. Wrap up and Public Comment**

Public comment will be limited to time available at the discretion of the SAT Chair.

4:30 p.m. **Adjourn**

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
AUGUST 30, 2005 MEETING SUMMARY
Ludwick Community Center
864 Santa Rosa Street
San Luis Obispo, California 93401

SAT members present: Mark Carr, Doyle Hanan, Rikk Kvitek, Steven Murray, Linwood Pendleton, Kenneth Schiff, Astrid Scholz, Dean Wendt

SAT members not present: Loo Botsford, Steve Gaines , Mark Ohman, Jeff Paduan, Stephen Palumbi, Kevin Piner, Susan Schlosser, Rick Starr, William Sydeman, Mary Yoklavich, Richard Young

Others present: Satie Airame (guest speaker, Partnership for Interdisciplinary Studies of Coastal Oceans - PISCO); Steve Barrager (SAT Chair), Michael DeLapa (MLPA staff), Heather Galindo (note taker; SAT support staff), Dr. Mary Gleason (MLPA staff), John J. Kirlin (MLPA staff), John Ugoretz (DFG staff) and approximately seven members of the public

Acronyms used: California Department of Fish and Game (DFG); geographic information system (GIS); marine protected area (MPA); MLPA Blue Ribbon Task Force (BRTF); MLPA Central Coast Regional Stakeholder Group (CCRSG); MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT)

Introductions, Welcome and Agenda Review

Chair Steve Barrager reviewed the agenda and thanked those who filled in during his absence. He then asked that agenda items take up less time than allotted to have time to discuss the CCRSG regional goals and objectives. MLPA Initiative Executive Director John Kirlin also welcomed everyone and thanked them for their work since the last SAT meeting.

John Ugoretz announced the next set of SAT presentations would be at the September 28-29, 2005 BRTF meeting. He also announced that the Fish and Game Commission unanimously adopted the MPF on August 18, 2005, including all of the sections involving SAT guidance. References to the appropriate scientific literature were added to sections contributed by the SAT. Although adopted, the MPF will remain a flexible document and suggestions for improvement will be considered. A discussion of overall peer review will be required as the process moves forward.

Revised SAT Guidelines

Steve Murray and Heather Galindo outlined the major changes to the SAT guidelines since the last SAT meeting. These included trying to make the document more generic as to apply to interactions between the SAT and all regional stakeholder groups, rearranging text, and clarifying the process of requesting information from SAT members at regional stakeholder

group meetings. Steve Murray went on to raise three major suggested changes to the guidelines that warranted open discussion before the changes were made:

- Clarify the process by which the SAT develops its recommendations
    - Discussion of whether the SAT should have recorded votes when approving recommendations and documents
    - Some thought recorded votes unnecessary since all recommendations are to be based on sound science and are therefore not a matter of opinion.
- Identifying how minority opinions on the SAT will be represented
    - All scientifically sound alternatives should be presented to the BRTF
    - SAT members should be explicit when expressing a view that does not represent the consensus of the SAT
- When making recommendations, determining whether SAT members should abstain from speaking unless speaking on behalf of the whole SAT
    - Recommendations to the BRTF should represent the views of the SAT as a whole and not that of an individual member
    - Some discussion of removing the sentence regarding this issue from the guidelines
    - Concern that some recommendations have previously gone to the CCRSG or BRTF that did not represent the whole SAT, especially given that a vote was not taken (examples include the sizing of MPAs based on larval transport and defining biogeographic regions)

The SAT guidelines were adopted with the intention to draft amendments as follows:

- When substantive decisions or recommendations are made. the SAT shall ensure that all members support the action taken. Where available science presents either options or uncertainty, the SAT shall frame and refer those policy questions to the BRTF.
- Outline a process by which tools needed for evaluation by the SAT are developed.
- Further clarify that requests for information from the SAT be restricted to the MLPA website and CCRSG meetings.
- Remove the term “spatial” when referring to MPAs.

CCRSG Regional Goals and Objectives

John Ugoretz explained that the CCRSG was in the process of developing goals and objectives on which to base the design of MPA alternative proposals framed by the goals of the MLPA. Although this discussion is still ongoing for the CCRSG, Ugoretz read the goals and objectives in their most recently revised format. The SAT was then asked to comment on both the objectives themselves and how the objectives might impact the way the SAT evaluated alternative proposals. In particular, the CCRSG was requesting help to develop measurable indicators to determine if the objectives would be met by a proposal. John Ugoretz also explained that some objectives were likely to become “design considerations” which must be considered when developing proposals, but do not require a measurable indicator.

CCRSG goals and objectives discussed were:

Goal 1. To protect the natural diversity and abundance of marine life, the structure, function, and integrity of marine ecosystems.

- Obj1. Protect areas of high species diversity and maintain species diversity and abundance, consistent with natural fluctuations, of populations in representative habitats.
- Obj2. Protect areas with diverse habitat types in close proximity to each other.
- Obj3. Maintain natural size and age structure and genetic diversity of populations in representative habitats.
- Obj4. Maintain natural trophic structure and food webs in representative habitats.
- Obj5. Maintain ecosystem structure, function, integrity and ecological processes to facilitate recovery of natural communities from perturbations both natural and human-induced.

Goal 2. To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.

- Obj1. Help protect or rebuild populations of rare, threatened, endangered, depleted, or over fished species, where identified, and the habitats and ecosystem functions upon which they rely.
- Obj2. Protect larval sources and enhance reproductive capacity of species most likely to benefit from MPAs through retention of large, mature individuals.
- Obj3. Protect selected species and the habitats on which they depend while allowing the harvest of migratory, highly mobile, or other species where appropriate through the use of state marine conservation areas and state marine parks.

Goal 3. To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbances, and to manage these uses in a manner consistent with protecting biodiversity.

- Obj1. Ensure some MPAs, including state marine reserves, are close to population centers, research and education institutions, and traditional non-consumptive recreational use and are accessible for recreational, educational, and study opportunities. [Work group version included here - all are pretty similar.]
- Obj2. To the extent possible, provide replicate state marine reserves to function as reference areas for research and monitoring to assess impacts of human use activities and natural events. [Proposed editorial revision - Similar types of marine habitats and communities shall be replicated, to the extent possible, in more than one state marine reserve as reference areas for research and monitoring to assess impacts of human use activities and natural events.]

- Obj3. Develop collaborative scientific monitoring and research projects evaluating MPAs that link with classroom science curricula, volunteer dive programs, and fishermen of all ages, and identify participants.
- Obj4. Protect or enhance recreational experience by ensuring natural size and age structure of marine populations for observation, photography, and other non-consumptive uses. [Proposed for deletion.]
- Obj5. Improve public outreach related to MPAs through the use of docents, improved signage, and production of an educational brochure for central coast MPAs.

Goal 4. To protect marine natural heritage, including protection of representative and unique marine life habitats in central California waters, for their intrinsic value.

- Obj1. Identify and protect unique habitats, such as estuaries, heads of submarine canyons, pinnacles, upwelling centers, and larval retention areas for their intrinsic value. [Proposed editorial revision - Identify and protect unique habitats for their intrinsic value.]
- Obj2. Protect representatives of all marine habitats identified in the MLPA or the Master Plan Framework across a range of depths for their intrinsic value.

Goal 5. To ensure that central California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.

- Obj1. For each MPA, develop objectives, a long-term monitoring plan that includes standardized biological and socioeconomic monitoring protocols, and a strategy for MPA evaluation, and ensure that each MPA objective is linked to one or more regional objectives. [Proposed revision: "For all MPAs in the region....]
- Obj2. In developing alternative MPA proposals, consider existing state and federal programs, including but not limited to those related to water quality, fisheries management, species recovery, and those of the Monterey Bay National Marine Sanctuary.
- Obj3. To the extent possible, site MPAs adjacent to terrestrial federal, state, county, or city parks, marine laboratories, or other "eyes on the water" to facilitate management, enforcement, and monitoring. [Proposed as design consideration.]
- Obj4. If necessary, phase the implementation of central coast MPAs to ensure their effective management, monitoring, and enforcement. [Proposed deletion; refer to BRTF.]
- Obj5. To the extent possible, site MPAs to facilitate use of volunteers to assist in monitoring and management. [Proposed design consideration.]
- Obj6. To the extent possible, site MPAs to take advantage of existing long-term monitoring studies. [Proposed design consideration.]
- Obj7. Develop regional management and enforcement measures, including cooperative enforcement agreements, adaptive management, and jurisdictional maps, which can be effectively used, adopted statewide, and periodically reviewed.

- Obj8. To the extent possible, design MPAs boundaries that facilitate ease of public recognition and ease of enforcement.
- Obj9. To the extent possible, effectively utilize scientific guidelines in the Master Plan Framework, including size and spacing of MPAs, in the overall design of individual MPAs.
- Obj10. Secure funding for monitoring, management, and enforcement before adequate implementing any new MPAs. [Proposed edit out "adequate implementing any new MPAs"; proposed deletion; refer to BRTF.]

Goal 6. To ensure that the Central Coast's MPAs are designed and managed, to the extent possible, as a component of a statewide network.

- Obj1. To the extent possible, effectively utilize scientific guidelines in the Master Plan Framework, including those related to size and spacing of MPAs, in the overall design of the central coast MPA network component.
- Obj2. Develop a regional review and evaluation of implementation effectiveness to determine if regional MPAs are an effective component of a statewide network
- Obj3. Develop a mechanism to coordinate with future MLPA regional stakeholder groups in other regions to ensure that the statewide MPA network meets the goals of the MLPA.

Ugoretz then opened the topic to general discussion by SAT members. Major points included:

- How is the CCRSG defining the terms "natural size" and "age structure" since they are used several times in the objectives? (It was suggested there was an underlying assumption that just by not removing a species the natural structures will be maintained.) Suggestion that this phrase was limiting as an objective.
- Request to develop measurable indicators to evaluate existing MPAs, plan for future MPAs, and long-term monitoring of future MPAs.
- How will the target values for measurable indicators be established?
- Suggestion that desirable trajectories rather than specific values be established for measurable indicators. Trajectories might be compared before and after MPA implementation or between an MPA and a reference site.
- Clarification that MPA alternative proposals will likely include existing MPAs.
- Goal 4 – Intrinsic value is impossible to measure. A footnote should be included to emphasize that this value is without regard to economic value or perhaps there should be parallel objectives for economic and intrinsic value. (SAT members recruited to work on language for this goal.)
- Goal 3 – Related objectives having to do with access can be measured in many ways (e.g. parking availability, entry fees, distance).
    - Obj1. How will distance be measured?

  - Obj2. Replicates of all types of MPAs and some non-MPA areas are required to allow for scientifically rigorous studies if certain comparisons (such as between fishing gear types) are desired. How many replicates are necessary?
  - Obj3. – Are all programs weighted equally?
  - Obj4. Should be explicit about measurable attributes to determine if recreational enjoyment is enhanced. Reminder that the MLPA lists recreational fishing as a recreational activity to be enhanced by MPAs.
  - Obj5. Accessibility of programs to demographic sectors of various cultural, language, economic, etc. backgrounds is important.
- Goal 1 – objectives 3-5 include the word "maintain" but do not define what is meant by the term. Suggestion that because only human behavior is being managed, it is only appropriate to talk about maintaining certain human activities, not maintaining the ecosystem or its inhabitants.
- Emphasis that there should be strong agreement between CCRSG's goals and objectives and the MPA proposal evaluation criteria.
- Need to define "minimal human disturbance".
- Since trophic cascades will likely cause a decrease in some species along with increases in others, how will the key indicator species be chosen? This is especially important because species on the species likely to benefit list are expected to increase.
- How do you empirically demonstrate that an MPA network is functioning in terms of larval transport?
- Are the objectives meant to apply to individual MPAs or groups of MPAs? (Suggestion that MPAs should meet all objectives collectively but not necessarily on an individual basis.)
- Will the CCRSG goals and objectives set the standards for the rest of the state?
- Use of models should be included in objectives especially when determining desirable trajectories of measurable indicators.
- Considering water quality at proposed MPA sites should be included as a design consideration.
- SAT will only be able to use objectives with measurable indicators when evaluating proposals and can suggest datasets helpful for such evaluation.
- It might be important to measure a variety of other environmental and human-induced factors to explain changes in measurable indicators.
- Request to consider if goal 1, objective 5 is measurable.

The discussion closed with the idea that feedback on the CCRSG goals and objectives would be iterative between the CCRSG and SAT.

MPA Evaluation

John Kirlin opened the discussion by reminding the SAT that the product of the MLPA Initiative is the identification and valuing of alternative MPA proposals for consideration by the BRTF, DFG, and Fish and Game Commission in turn. The process does not have to yield a single proposal or even a series of ranked proposals, but all proposals must be clearly understood and evaluated.

John Kirlin presented a spreadsheet in which the targeted activities for the SAT in relation to the MLPA Central Coast Project are designated by month as follows:

- October 2005: SAT will complete science presentations to BRTF and CCRSG. In addition, SAT will review MPA inventory developed by CCRSG.
- November 2005: First evaluation of MPA packages developed by CCRSG
- December 2005: Second evaluation of MPA packages developed by CCRSG

Astrid Scholz gave an update from the MPA Evaluation Sub-Team based on the major points in a recent memo:

- <u>How we got to where we are</u>

  Placeholder proposal was developed to identify logistical and analytical needs, which are as follows:
  - On-demand GIS capacity
  - A way to assess network characteristics or proposal alternatives
  - A way to assess multiple and potentially conflicting objectives
- <u>The evaluation task at hand</u>
  - Evaluating multiple objectives for each alternative proposal
  - Considering what weight to give objectives in proposals
  - Evaluating different mixtures of several MPA types (including no MPAs)
  - How to come up with a scientific standard for evaluating proposals
  - Anticipate that the CCRSG will likely look to the SAT for additional information particularly concerning the geodatabase
- <u>Why new tools?</u>
  - To develop a yardstick for evaluating proposals rather than relying on comparisons between proposals
  - The standard in other similar planning processes has been to use spatial modeling methods to design MPA alternatives instead of just evaluating proposals
  - Evaluation of existing modeling tools

- How do these pieces relate to each other and on-going efforts?
    - Flowchart presented indicated that the CCRSG will design alternatives using the IMSG tool while the SAT will evaluate the alternatives using its own tool(s). All tools will likely rely on the geodatabase housed at UCSB.

Kirlin followed up by mentioning three existing contracts with SAT members:

- Contract for UCSB data management and presentation via a geodatabase
- Contract with Ecotrust to increase spatial resolution of fishing effort data
- Contract for follow-up on a socio-economic study

He then added that official guidelines for entering into contracts with SAT members should be established, although no existing contracts represented any conflicts of interest.

John Kirlin moved the discussion to networks by reminding the SAT that although "networks" are key to the MLPA, the term is not defined in the act itself. The BRTF has advised to not unnecessarily limit what the term means. He then suggested that there are several dimensions relevant to the idea of networks:

- A managerial approach to defining networks
- Monitoring and evaluating MPA networks
- Networks of ecosystems
- Connectivity in networks via larval dispersal
- Adult neighborhoods and ranges as they pertain to networks
- Life stages across habitats as a network
- Networks of oceanographic features

John Kirlin followed by suggesting that it's important to think about not only what these dimensions mean, but also how they will be measured and incorporated in network design. He then opened the discussion to receive comments from the SAT.

SAT members reiterated that it will be important to come up with a list of definitions for "network" given the variety of dimensions above. One example definition is from the National Research Council's book on MPAs which defines networks in terms of larval connectivity. It was proposed that these definitions could be included in the upcoming SAT presentation about MPA design. It was also suggested that how stakeholders think about networks will be important when it comes to evaluating MPA proposals. The SAT and CCRSG should communicate to each other what is meant by "networks." It was reiterated that it will be the job of the SAT to evaluate both individual MPAs and MPA networks in terms of the CCRSG goals and objectives. Existing MPAs will likely be part of the proposals so they will also be evaluated. However, the only objectives that currently address networks are under goal 6. It was suggested that evaluation criteria for network efficacy be based on likelihoods rather than expecting measurable attributes.

John Kirlin finished the discussion by mentioning that there is currently an MLPA Initiative contract to summarize literature on networks and that he would collect further feedback on this topic and circulate for discussion next time. He then introduced Satie Airame as the Policy and Outreach Coordinator for the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO).

Satie Airame outlined the MPA planning process from the Channel Islands and compared it to the MLPA. She began by saying that although the Channel Islands process was different in size and scale from the MLPA, it did have a science advisory team and a stakeholders group. The stakeholders were responsible for developing the goals and objectives and having these strong from the beginning proved to be critical. This was especially true concerning clear definitions of terms used in the goals and objectives. The scientists then developed measurable criteria to analytically determine if the MPA designs met the goals and objectives. Important things for the SAT to consider include:

- How to evaluate different types of MPAs such as reserves, parks, and conservation areas in terms of meeting goals and objectives?
- In the Channel Islands, ecological and economic data were analyzed separately. Tools were used to parse data into evaluation planning units that were included in MPA designs.
    - Examples of ecological data are locations of biological diversity hotspots and species of special concern.
    - For economic data, the potential cost of closing each planning unit to extraction was calculated. Suggestion to also consider things like changes in behavior and displaced effort for the MLPA process.
- Monitoring is just as important as evaluation to determine if expected outcomes will occur. She suggested a book on modeling tools titled, *Place Matters: Geospatial Tools for Marine Science, Conservation, and Management in the Pacific Northwest* (Eds. Dawn J. Wright and Astrid J. Scholz).

Satie Airame finished by saying that the Channel Islands process produced five official MPA proposals plus a no-action option after about eight months of iteration between the stakeholders and the scientists. The adopted design was a compromise between proposals. She reiterated that it is a policy decision to determine the desired objectives, but science can help develop measurable evaluation criteria.

The SAT wes reminded that the timeline for the central coast study region is shorter and the BRTF could help with reducing the number of proposals for evaluation. Satie Airame emphasized that clear goals and objectives would help to refine proposals and suggested developing an online database containing the attributes of key areas likely to be included in proposals. John Kirlin requested there be at least two rounds of proposal drafting/evaluation for the central coast study region.

John Ugoretz reminded the SAT that the MLPA process has the advantages of being guided by the draft MPF and was designed to produce several alternative proposals to be evaluated

by the SAT, BRTF, DFG, and Fish and Game Commission in turn. He added that the current SAT is paneled until November 2006 and will likely be consulted further along the process as the BRTF and DFG consider the proposals in an adaptive and iterative manner. He ended by saying that some goals and objectives might not have measurable criteria to be evaluated by the SAT and also that the SAT might come up with measurable criteria that are not explicitly in the CCRSG goals and objectives.

Mary Gleason reiterated the request to the SAT to help develop qualitative or quantitative criteria related to goals and objectives. She then gave a presentation on the support tool created to aid the CCRSG in the design of MPA proposals. Major aspects of the tool are as follows:

- Visible data layers are based on readily available data.
- Data layers include information like fisheries data from DFG, habitat mapping, and major geographic features.
- The data are housed at the UCSB geodatabase.
- The tool is designed to be a decision support tool to aid the CCRSG in developing MPA proposals.
- The user can select individual data layers to be viewed and the tool will report on the characteristics of hypothetical MPAs that are drawn by the user.
- Distances will be given in several formats (e.g. kilometers, miles, nautical miles).
- Some data layers can be viewed but will not be included in reports if they are not of sufficient quality. Each data layer will have an abstract describing the data and its limitations.
- There will be a link to this tool on the MLPA website and it will be available to the public in October.
- Users can login as individuals or groups and can save their work privately or make it available for public viewing.
- The tool is supported by the MLPA Initiative, Monterey Bay National Marine Sanctuary (MBNMS), and the National MPA Center. The tool will be used in both the MLPA Initiative and MBNMS planning processes.

Mary Gleason added that the GIS staff will include information about what kind of review has been done of each data layer including caveats or concerns about how the data should be used. SAT members will be asked to review particular layers based on their expertise.

John Kirlin suggested that feedback be directed toward a discussion of data. SAT comments included the following:

- SAT should develop list of minimum types and amounts of data to be included with each MPA proposal (either the CCRSG or MLPA Initiative staff would be responsible for ensuring the appropriate data are included)
- Request for analytical or search capabilities in the tool (response suggested MARXAN as a tool with those capabilities)

- Suggestion to modify pictures on the opening page to include humans and exclude marine mammals
- Include metadata in the visual layers to ensure they are read by the user.
- SAT should develop ranking system for data quality and establish minimum quality standard for acceptable data - should be communicated to the CCRSG as soon as possible as it develops proposals
- Can tools such as MARXAN simultaneously consider economic and ecological data?
- Emphasize that analytical tools will be used by the SAT to evaluate proposals, not develop them, although there will be opportunities to provide feedback about how to improve proposals
- Difficult to determine levels of data accuracy needed to evaluate proposals without knowing how different the proposals will be from each other

Species Likely to Benefit List

Doyle Hanan gave an update on the progress of the SAT Species Likely to Benefit Sub-Team. He commended the DFG for putting together the list. He went on to say that although it is assumed that the major impact of an MPA is to reduce the number of fish taken, there are likely a variety of direct and indirect effects such as:

- Direct effects: Changes in abundance of target harvest species
- Indirect effects: Predator-prey relationships, impact of fishing gear

The sub-team worked with a version of the species likely to benefit list put together by Paul Reilly and separated by rocky vs. sandy habitats. The status of the fishery was included if known. The sub-team also developed a list of important considerations for each species on the list:

- Does species occur on the central coast?
- Is species either directly or indirectly affected by fishing?
- Information about species mobility or dispersal
- Does species have a small adult neighborhood size?
- What is the species population trend /stock size or status (if known)?
- Is there a particular life stage that may benefit?
- Does the response of the species depend on location?

Other important questions include:

- What are the effects outside MPAs?
- What are the effects of existing regulations?
- What species may indirectly benefit?
- Is the list complete? Do we need to add or delete species?

John Ugoretz thanked the sub-team for a good start. He then emphasized the importance of putting together a list targeted at the central coast. He noted that all twelve species the sub-team indicated to be of special concern were in rocky habitats.

Comments from SAT members included:

- Will this list serve as a target for the design of some MPAs or just help overall with design and evaluation?
- It is important to clearly define the term "benefit" and where these benefits are expected to occur (e.g. inside vs. outside MPAs).
- What is the targeted scale of species protection (i.e. number of individuals, populations, etc.)? A suggestion was made that modeling could help answer this question.
- It is important to consider species that form critical habitat.
- Should suites of species (e.g. shelled gastropods) be included in the list?
- Species that may indirectly benefit (e.g. birds) should be included in the text of the document but not in the list itself.
- A suggestion was made to designate species likely to benefit that are also of economic importance.

Action items were developed to address some of the comments.

Request for SAT contributions to CCRSG Regional Profile

Mary Gleason announced that although the regional profile will remain a living document, the final draft will be finished by September 6. The approved version will be placed in a 3-ring binder so updates can be easily made in the future. She requested help from the SAT to review the document as a whole and also to concentrate on the following topics:

- Maps of oceanographic features
- Maps of retention areas
- Maps of freshwater plumes
- Section 3.3 regarding areas of biodiversity significance

Mary Gleason requested all feedback be emailed to her directly as soon as possible.

Update on Central Coast Stakeholder Group and Questions

Mark Carr summarized the agenda and events of the August 10-11, 2005 CCRSG meeting in Monterey. He then asked the SAT to comment on draft answers to science-related questions submitted by the CCRSG and other parties. The major points of the discussion are organized by question:

B-18: *Can coastal closures such as MPAs be as effective as seasonal fishery closures? For instance, the nearshore rockfish fishery—less than 240 feet) is currently closed half the year.*

What would the required equivalent marine reserves or parks or conservation areas be as a percentage of coast or seafloor?

- This is really two questions and the response should be removed because it is incomplete.
- Impact of closures on size and age structures are known.

B-20: *Please describe the currents and back eddies within Carmel and Monterey Bay and discuss the implications for larval dispersal.*

- Plan to work with oceanographers to develop a response.

B-23: *What species have produced an unnaturally low amount of larvae and how do we know of those occurrences?*

- Request clarification if this question is aimed at the individual or population level.

B-24: *What factors are depressing clam populations and why do whole areas of previously very productive clam habitat not show recovered clam populations? What factors are similarly depressing abalone and sea otter populations? What is the interrelationship among these three species? What steps could be taken which might benefit populations for all three species?*

- Second paragraph should be modified to consider that humans are likely to have impact.
- Attempt to draw a relationship between abalone and clams is probably not necessary.
- A few individual southern sea otters may exist outside the proscribed range.

B-25: *What baseline or other factors would influence any increase or decrease in economic value for non-consumptive uses due to the establishment of new MPAs?*

- This answer should include something about biological performance.

B-26: *How and to what extent have increased regulations and area closures, both state and federal, contributed to an increase in biodiversity and/or size and abundance?*

- The answer is correct for rebuilding plans in general, but there may not be a study about the efficacy of area closures in particular.
- Answer doesn't appropriately respond to the question.

B-29: *Do we have evidence that sea otters limit the fishery for Dungeness crab?*

- Response should reflect that while there are no data for California, studies from Alaska are being pursued.

B-30: *What can you tell us about how to select sites for MPAs so as to optimize its value and maximize its socio-economic benefits?*

- Answer to this question should be modified to match the response already issued to the CCRSG members.

Revised responses to all questions will be issued at the September 7-8, 2005 CCRSG meeting.

Public Comment

A single individual made the following points:

- Suggestion that some answers to CCRSG questions be reviewed by someone with legal expertise
- Strong support for goal 3, objective 2 although it does not have to remain under goal 3
- Urge SAT to consider the economic value of species outside of fishing values

Upcoming Meetings

The next SAT meeting will be held on Monday, September 19, 2005 in Santa Cruz, CA.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Monday September 19, 2005
9:30 a.m. - 4:30 p.m.

National Marine Fisheries Service, Santa Cruz Lab
110 Shaffer Road, Santa Cruz, CA 95060

This meeting will be videotaped for future viewing on the Internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Adopt Master Plan Science Advisory Team (SAT) guidelines*
- *Discuss and adopt prioritized list of central coast species likely to benefit*
- *Discuss criteria, process, and tools for MPA evaluations*
- *Review and discuss adopted Central Coast Regional Stakeholder Group (CCRSG) goals, objectives and design and implementation criteria*
- *Review and discussion of questions from CCRSG*

9:30 a.m. **1. Welcome, review of agenda, and recent updates**
Steve Barrager, Chair, MLPA Master Plan Science Advisory Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA / Nearshore Ecosystem Coordinator, California Department of Fish and Game

9:45 a.m. **2. Revised SAT Guidelines** – *Steve Murray*
A. Review and discuss revised SAT guidelines
B. Adopt guidelines

10:15 a.m. **3. Species Likely to Benefit List** – *Doyle Hanan*
A. Presentation of proposed list and criteria
B. SAT discussion and modifications to list
C. Adoption of list to forward to CCRSG and BRTF

11:15 a.m. **4. CCRSG Regional Goals and Objectives** –
Paul Reilly, Central Coast MLPA Coordinator, Department of Fish and Game
Michael DeLapa, Central Coast Project Manager, MLPA Initiative
A. Review adopted list of goals, objectives, and design and implementation criteria
B. Discuss potential indicators for monitoring and relationship of these preliminary indicators to long-term monitoring benchmarks

12:00 p.m. **Lunch** – Please be prepared to purchase lunch; we will hopefully order from a nearby restaurant and bring lunch in

1:00 p.m. **5. Evaluation of existing and proposed MPAs**

A. Update from evaluation sub-team
B. Review revised evaluation matrix
C. Gap analysis of existing MPAs for habitats, size, spacing and other objectives
D. Discuss how specific non-MPA management measures impact these needs
E. Discuss criteria, process and tools for proposed MPA evaluations

2:15 p.m. **Break**

2:30 p.m. **6. Draft Presentations**

A. Schedule for presentation to CCRSG and BRTF
B. Review major changes to three previous draft presentations:
   1. Lifetime egg production and big old fat females – Loo Botsford
   2. Larval Movements – Mark Carr
   3. Adult Movements – Rick Starr
C. Water Quality Impacts – Ken Schiff
D. Network Design – Steve Gaines (update on progress if not full draft)

4:00 p.m. **7. Update on Central Coast Stakeholder Group and Questions** – *Mark Carr, Dean Wendt*

A. Review of results of meeting
B. Review questions from the stakeholder group and potential answers

4:15 p.m. **8. Wrap up and Public Comment**

Public comment will be limited to time available at the discretion of the SAT Chair.

4:30 p.m. **Adjourn**

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
SEPTEMBER 19, 2005 MEETING SUMMARY
National Marine Fisheries Service, Santa Cruz Lab
110 Shaffer Road
Santa Cruz, CA 95060

SAT members present: Loo Botsford, Mark Carr, Steve Gaines, Doyle Hanan, Steven Murray, Jeff Paduan, Stephen Palumbi, Kenneth Schiff, Astrid Scholz, Rick Starr, William Sydeman, Mary Yoklavich

SAT members not present: Rikk Kvitek, Mark Ohman, Linwood Pendleton, Dave Schaub, Susan Schlosser, Dean Wendt, Richard Young

Others present: Steve Barrager (SAT Chair), Michael DeLapa (MLPA staff), Heather Galindo (note taker; SAT support staff), John J. Kirlin (MLPA staff), John Ugoretz (DFG staff), Paul Reilly (DFG staff), Paulo Serpa (DFG staff) and approximately 10 members of the public

Acronyms used: California Department of Fish and Game (DFG); geographic information system (GIS); lifetime egg production (LEP); marine protected area (MPA); MLPA Blue Ribbon Task Force (BRTF); MLPA Central Coast Regional Stakeholder Group (CCRSG); MLPA Central Coast Science Sub-Team (CCSST); MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT)

Introductions, Welcome and Agenda Review

SAT Chair Steve Barrager welcomed everyone to the meeting and gave a summary of the agenda. He announced that the Central Coast Regional Stakeholder Group (CCRSG) adopted a set of goals and objectives including revisions based on SAT input. John Kirlin agreed that adopting the goals and objectives is a major accomplishment and said the CCRSG is working as a group very effectively. The CCRSG will now turn their attention to developing packages of MPA alternatives that will, in turn, come to the SAT for evaluation. John Kirlin reminded the SAT about the upcoming BRTF meeting in San Luis Obispo on September 28-29, which will involve reporting on the goals and objectives and more presentations from the SAT. John Ugoretz finished the introduction by thanking the SAT for its work and recognizing the scope of work the SAT has before it and its importance to the work of the CCRSG. He added that at the end of the meeting he would like to work on scheduling SAT meetings for 2006.

Revised SAT Guidelines

Steve Murray gave an update on the SAT guidelines document that was provisionally approved at the August 30, 2005 SAT meeting. Major revisions since the approval included:

- Changes in the language describing interactions between the SAT and regional stakeholder groups in hopes of streamlining the process
    - Science questions to be submitted during CCRSG meetings or via the MLPA website only

  - SAT regional sub-team and MLPA Initiative staff to prioritize questions based on relevance to the process
- Refining the protocol for how the SAT makes decisions
  - SAT to make recommendations incorporating the full set of views of SAT members
- Addressing the potential conflict of interest when awarding contracts to SAT members
  - Important to emphasize that contract decisions are made by MLPA Initiative staff and not by the SAT.
  - A SAT member with a proposal for a contract will not evaluate that proposal or the direct work products resulting from the contract.
  - The following sentence will be added to the guidelines: "These award decisions are not within the purview of the SAT and do not imply SAT endorsement."
- The word "spatial" in reference to MPAs deleted from the document
- The document made generic for interactions between the SAT and all regional stakeholder groups

The revised version of the SAT guidelines was approved later in the meeting after all above changes were made.

Species Likely to Benefit List

Doyle Hanan gave an update on the species likely to benefit list and accompanying text. He thanked the SAT members for draft submissions and asked the SAT for feedback on the current draft version of the entire document. He also thanked Paul Reilly of DFG for feedback on the list. The discussion of the text portion of the document included:

- The draft introductory paragraph was good and provided an ecosystem, instead of just single species, perspective.
- Benefits are important, both as stated in the law and from a community perspective.
- The introduction should be followed by one or two sentences describing the effects of MPAs.
- There was concern about the terms "might" and "may" benefit.
- Repetition in the text should be minimized.
- It is important to acknowledge that benefits to a species might depend highly on the local conditions prior to MPA implementation, especially with regard to fishing pressure.
- Benefits to species will also depend on the goals, objectives, and designs of the MPAs.
- Benefits may vary across life stages.
- A suggestion was made that currently managed fish species not be included in the list, although fisheries management may not address issues with fish population size and age structure.
  - Clarification that the goal of the list is to identify species that will benefit from spatial management, not to identify species in need of spatial management

  - Time frames of management plans and MPA implementation may differ
  - Debate about importance of explicitly addressing the interaction of MPA implementation and fisheries management including issues such as optimum yield and stock assessment (suggestion to have a dialog between the SAT and fisheries management council groups on this issue)
  - Emphasis that MPAs have effects beyond fisheries management
- Algae can be added to the list with a footnote indicating that the abundances of algae and sea grasses can be strongly impacted by indirect effects in MPAs.
- Text should be added about seabirds and mammals.
- Text should be limited to addressing the objectives of the document.

Doyle Hanan then directed the discussion towards the list itself. The list for species living in rocky habitats was organized by depth. The list was also color-coded to indicate proposed additions and deletions along with whether the species is currently depleted. Major points of discussion included:

- Depleted species in the central coast region should definitely be included.
- Inclusion in a commercial fishery should not be required for a species to be listed. Other factors such as sedentary life histories, incidental catch, and size-age population structure should also be considered.
- Prioritizing the list by indicating species more or less likely to benefit is in line with the accompanying text and objectives of the document. Categories should be created in an informational context.
- Prioritizing the list with respect to current status of the fishery might cause complications if the status of a fishery changes or is currently unknown.
- The list will evolve. For example, ongoing analysis of lifetime egg production for some species on the draft list may influence prioritization decisions.
- It is important to summarize how species were selected for the list.
- Documented evidence of benefits from existing MPAs should be considered for candidate species.
- Each species on the list should be assessed for each of the criteria listed in the text portion of the document.
- Species on this list are likely to be used in assessing the performance of the MPAs.

It was agreed that more work on the species likely to benefit list and accompanying text would continue outside the meeting. John Ugoretz emphasized that this document is a SAT product and will be important for the CCRSG as it assembles MPA proposals. The focus on particular species and some prioritization of species would be particularly helpful. The SAT should be in agreement about the final product.

CCRSG Regional Goals and Objectives

Paul Reilly summarized the development of the goals and objectives to date. Over the course of one CCRSG meeting, two conference calls involving a working group and MLPA Initiative staff, and additional work by the staff, 130 potential objectives were reduced to 33. Developing the objectives was guided by the goals of the MLPA that were slightly modified to be specific to the central coast study region, but with a statewide network in mind. At the August and September 2005 CCRSG meetings, the stakeholders considered each of the 33 objectives carefully and incorporated feedback from the SAT discussion held on August 30, 2005. The final product includes 19 objectives, 10 design considerations, and 4 implementation considerations. John Ugoretz added that a few undecided issues would be presented to the BRTF and he would like to accompany them with additional feedback from the SAT. He also emphasized that the CCSST had been involved in every step of the goals and objectives development and that the CCRSG had unanimously adopted the document.

John Ugoretz presented the SAT with two versions of goal 4, objective 1 that had both been approved by the CCRSG:

Goal 4. To protect marine natural heritage, including protection of representative and unique marine life habitats in central California waters, for their intrinsic value.

1. Option a. Include within MPAs the following habitat types: estuaries, heads of submarine canyons, pinnacles, upwelling centers, and larval retention areas.
1. Option b. Include within MPAs the following habitat types: estuaries, heads of submarine canyons, pinnacles, upwelling centers.

Although the decision would ultimately be made by the BRTF, John Ugoretz asked the SAT to make a recommendation. He stated that DFG staff would endorse option 1b without explicitly naming larval retention areas since they do not appear to be mappable outside of Monterey Bay.

The SAT recommendation on goal 4, objectives 1 and 2:

> Given that upwelling centers and larval retention areas are representative habitats and mappable in a gross sense (using headlands as a proxy for upcoast upwelling, downcoast retention) they are included in objective 2 and thus do not need additional note in objective 1. This would result in selecting objective 1b and eliminating “upwelling centers” from that objective.

The discussion leading to this recommendation included the following major issues:

- Larval retention areas are listed as a habitat type in the MPF. Is the intent to have them treated as all other habitats (e.g. criteria for replication, protection, etc.)? Or is the intent instead to recognize that larval retention areas and upwelling centers exist and there are consequences for including or not including them in MPA designs?
- Some larval retention areas are mappable, such as in northern Monterey Bay and south of Point Reyes.

- Plankton species compositions differ north and south of headlands indicating larval retention areas are likely to be associated with headlands. Birds are also likely found south of headlands in retention areas.
- Two major headlands exist in the central coast study region.
- There was much agreement that both upwelling centers and larval retention areas are important and should be considered, but not necessarily treated exactly like other habitat types listed. Both features are associated with biological indicators such as species composition.
- Goal 4, objective 2 covers the importance of representing all habitat types listed in the MPF in MPAs and therefore includes upwelling centers and larval retention areas.
    - Goal 4, objective 2: Protect, and replicate to the extent possible, representatives of all marine habitats identified in the MLPA or the MPF across a range of depths.
- Habitats with both high and low biological diversity should be considered and included in MPA design.

Other important details of revisions by the CCRSG to the goals and objectives included:

- The CCRSG adhered to the SAT suggestion to change the word “maintain” to “protect” in the objectives, but chose to retain the word “disturbance” rather than the SAT suggestion of “perturbations”.
- SAT input and language was included in the revision of goal 3, objective 2 concerning replication of MPAs.
- SAT recommendation to include water quality was added as a design consideration, although in a somewhat vague way.
- SAT advice about forming separate objectives to deal with consumptive and non-consumptive recreational uses was considered.
- Design consideration 1 was written by non-socioeconomic scientists and is not intended to be read technically. A SAT member explained that a technical reading of this design consideration would commit the process to measuring impacts in a very specific way.

Evaluation of Existing and Proposed MPAs

John Kirlin opened the discussion by emphasizing the importance of SAT input on the monitoring and evaluation of MPAs. On the subject of networks, he explained that none of the existing contracts included information about networks, but that networks would be the topic of one of the upcoming SAT presentations to the BRTF and possibly CCRSG.

John Kirlin went on to explain that the monitoring and evaluation matrix document created by MLPA Initiative staff was based on the design considerations in the MPF and the goals and objectives of the CCRSG. The purpose of further SAT input is to fill in gaps in the matrix, but not to add new evaluation criteria. The October CCRSG meeting will be focused on devising a

process by which MPA proposals are created and organized. The matrix will be valuable both in creating proposals and in evaluating them.

In addition to the matrix, various SAT members have proposed the development of tools to aid in SAT evaluation of MPA proposals. All proposals must be submitted to the appropriate budget authority and will be handled as directed in the newly revised and adopted SAT Guidelines.

John Kirlin finished his introduction by asking the SAT to consider whether different monitoring and evaluation criteria are needed to evaluate existing MPAs, MPA proposals, and long-term MPA effects in light of the MLPA goals concerning ecosystem-based management. In addition, is there other information from MPAs that might be useful in answering scientific questions about the marine environment in general? A conference call organized by MLPA Initiative staff will be held on these topics tomorrow.

John Ugoretz then gave a description of the monitoring and evaluation matrix document. The goals and objectives were updated to reflect the most recent version from the CCRSG. The best data available was used which included coarse scale data everywhere and fine scale data where available. In the matrix itself, representative habitats are divided by type and depth where applicable. The amount of each habitat in existing MPAs is quantified. The following color codes were used to indicate data sources:

- Yellow: Coarse scale habitat mapping (200m resolution)
- Green: Fine scale habitat mapping (1-5m resolution, sources: CSUMB and USGS)
- Pink: Anecdotal data

Anecdotal data collection was limited to CCRSG members, MLPA Initiative staff, and SAT members. In particular, CCRSG members were given a form and asked to list the habitat types in each MPA. They were also asked about the presence or absence of 13 species from the draft species likely to benefit list. Some stakeholders were asked about the levels and types of usage in certain areas. John Ugoretz then invited socio-economic expertise on appropriate uses of the data collected and heeded advice about careful documentation of the data collection method.

Size and spacing guidelines from the MPF have been included in the matrix. However, freshwater plumes, larval retention areas, and upwelling centers have not. Versions of the matrix in various units (e.g. fathoms, feet, meters) are available. Protection status of species in MPAs was considered. Discussion by the SAT included:

- Data should be given in the same units regardless of source.
- The matrix should accurately reflect the true dimensions of the existing MPAs (e.g. maximum depth).
- Available studies or other sources of information for each MPA should be referenced.
- It is important to recognize the presence of more than the 13 listed species.

- The symbol “N/A” should be used to indicate when a cell is empty because the category is not applicable.
- The symbol “0*” should be used to indicate when fine scale data is not available but there is anecdotal data.
- Tables with both raw data and scaled estimates would be very useful. Using only raw data can be problematic if not all of the habitat in an MPA has been sampled.
- Habitat quality is important, but would be difficult to include in the matrix.
- Separating data by MPA type would be useful (e.g. three columns for the three types of MPAs listed in the MPF)
- If possible, it would be nice to have the data broken into 50 or 100-mile swaths.
- There was concern about a disconnect between the matrix, CCRSG goals and objectives, and evaluation criteria developed by the SAT Monitoring and Evaluation Sub-Team.

John Ugoretz announced that a revised version of the matrix would be sent to the SAT in a few days. He asked the SAT to focus their review on benchmarks used to evaluate existing MPAs, how benchmarks might respond in other areas after MPA implementation, and an appropriate measure for the diversity of habitat types. He also reminded them that evaluation of proposed MPAs included aspects not represented in the matrix (e.g. socio-economic goals and objectives).

John Ugoretz thanked the SAT members for their input and then introduced Paulo Serpa to talk about the mapping of pinnacles. Paulo Serpa explained that the pinnacle GIS layer is a preliminary count-point layer based on a mean change in relief of 10m or more in a 5m x 5m cell based on the bathymetric position index. The bathymetric position index is adopted from the well-referenced topographic position index. The data are a mosaic of data from California State University Monterey Bay (CSUMB) and United States Geological Survey (USGS) models converted to a 5m x 5m grid. There are some data artifacts where the datasets overlap, but staff is working with experts at CSUMB to resolve this issue.

A brief discussion highlighted that the data layer may be modified as it is more carefully reviewed. A SAT member suggested that other data sources on pinnacle location in the peer-reviewed literature be considered. The response from DFG staff indicated that in order to keep the data collection methods in the current pinnacle GIS layer unambiguous, such literature review additions or deletions would likely be included in a separate data layer.

Tools for the Evaluation of Existing and Proposed MPAs

John Kirlin led a discussion on a variety of tools that might be helpful in MPA evaluation for both the central coast study region and the rest of California. These tools would be in addition to the IMSG tool already developed by MLPA Initiative contractors. A summary of preliminary proposals for two tools is:

- Calculating lifetime egg production (Loo Botsford): LEP is calculated for a variety of rockfish species based on stock assessments and other existing data sets. Given a spatial arrangement and a variety of dispersal distances, LEP analysis can show how MPA networks affect population persistence. This analysis has been done with a stakeholder group in Point Reyes. LEP analysis has been done on five species already with datasets available for another six species. In addition, state and federal data sources are available for another 17 species. In total, there is potential for LEP analysis to be done on a total of 28 species. Some of this could be completed in the next few months.
- Updated version of MARXAN (Astrid Scholz, Steve Gaines, and Hugh Possingham): Tools like MARXAN have been useful in a variety of planning processes to help optimize MPA designs to meet specific goals and identify critical components of successful designs. However, in its current state MARXAN cannot consider biological and socioeconomic information at the same time. The current version also allows for only one type of MPA – marine reserves. Reviews on this subject were referenced in the document distributed at the August 30, 2005 SAT meeting. This proposal would support work to update MARXAN so that several types of data and MPAs could be considered simultaneously. This work could be done in a time frame of three to six months.

After outlining the proposals, Loo Botsford, Astrid Scholz, and Steve Gaines all left the meeting room pursuant to the SAT guidelines during the subsequent SAT discussion. In general, the SAT showed support for both proposals. An updated version of MARXAN would be a useful tool for the MLPA Initiative and other processes. Calculation of LEP could provide a means of evaluation in cases where stock assessments are not available (particularly for nearshore species). Both proposals offer additional sources of information and will help to reduce uncertainty in the process. However, it will be important to think about how value judgments should be considered along with the more quantitative measures from these tools.

John Kirlin closed the discussion by saying he would give the contracts further consideration and may contact SAT members for future discussion. He also agreed to post the titles and personnel (including bios) for existing contracts with the MLPA Initiative on the MLPA Initiative website.

Draft Presentations

John Ugoretz reminded SAT members that the following set of SAT presentations would be given in the morning of the BRTF meeting on September 29, 2005 in San Luis Obispo and again in the evening of the October 5, 2005 CCRSG meeting in Monterey:

- Population persistence (or the importance of big, old rockfish) - Dr. Louis Botsford, University of California, Davis
- Larval dispersal and recruitment - Dr. Mark Carr, University of California, Santa Cruz
- Adult movement and neighborhoods - Dr. Richard M. Starr, California State University, Monterey Bay

Draft versions of all three presentations were originally given at the SAT meeting on August 2, 2005. Please refer to the meeting summary from that day for more details on the presentations. Feedback regarding the updated versions:

- Population persistence (or the importance of big, old rockfish) - Dr. Louis Botsford, University of California, Davis
    - Initial slide about a fish life cycle can be used to introduce the concepts of how fishing young vs. old adults can affect population sustainability. This slide might be good to bring back when talking about lifetime egg production.
    - Important to use the terms “reserve” and “MPA” appropriately.
- Larval dispersal and recruitment - Dr. Mark Carr, University of California, Santa Cruz
    - Statement that 50% of invertebrates are in the plankton for under a day should be corrected.
    - Although slides explicitly addressing MPA networks have been removed since the last draft, talking about MPA size, location, and spacing with regard to the MPA design guidelines in the MPF is important.
    - It is not clear how the BRTF will define a network.
    - Purpose of talk is to provide the BRTF with basic knowledge on this topic.
- Adult movement and neighborhoods - Dr. Richard M. Starr, California State University, Monterey Bay
    - Most of the changes to this presentation since the last draft were to graphics and organization of topics.

Steve Gaines announced that the presentation on MPA network design was being designed in collaboration with Ray Hilborn and Loo Botsford.

Kenneth Schiff gave a presentation on water quality with the following major points:

- Aimed level of presentation for advanced high school/first year of college
- Sources of potential pollutants (examples below)
    - Point sources: treatment works, industrial facilities, power generating stations
    - Nonpoint sources: urban and agricultural runoff, dredged materials, atmospheric deposition, boating and shipping
- Types of pollutants (examples below)
    - Nutrients: nitrogen, phosphorous
        - Potential effects: eutrophication
        - Showed graph indicating nutrient concentrations from central coast rivers.
    - Toxics: metals, pesticides, herbicides
        - Potential effects: acute or chronic toxicity, bioaccumulation
        - Showed data relating fertilization success in sea urchins with level of toxic pollutants in the water

        - Showed data indicating the levels of DDT in some central and southern California fish and crabs
    - Pathogens: fecal indicator bacteria, virus, protests
        - Potential effects: gastrointestinal illnesses, other illnesses/infections, non-target diseases
        - Showed data for microbial levels at various beach sites
    - Emerging chemicals: endocrine disruptors, PBDE
        - Potential effects: hormone mimicry
        - Discussed increased estrogen levels found in male fish
    - Nontraditional pollutants: sediments
        - Potential effects: habitat alteration, light attenuation
        - Discussed satellite imagery of increased turbidity due to sediments
- Ken emphasized that not all pollutants are anthropogenic and not all anthropogenic discharges result in impacts
- The following aspects of water quality are important to consider in siting MPAs:
    - Proximity to historical, current, and future discharges
    - Areas of swimming advisories and closures
    - Areas of seafood advisories and closures

SAT discussion on the water quality presentation included:

- Slide with take home messages should be up front in the presentation
- Some data layers mentioned in the talk are available
- Brief mention of thermal impacts of power plants should be included, although thermal impacts are highly localized and entrainment is a far bigger impact (this can go in the section for non-traditional impacts)
- Potential for a separate presentation on the Diablo report
- Difficult to think how many of these impacts affect the open ocean
- Focusing on particular issues that are important to consider when siting MPAs would be helpful to BRTF and CCRSG. For example:
    - Impacts of outfalls
    - Quantifying impacts in space and time (these can sometimes be chemical specific)
    - Relative impacts of point versus non-point sources of pollution
    - How the geography of marine pollution relates to the geography of MPAs

Update on Central Coast Regional Stakeholder Group

This item was removed from this meeting's agenda due to time constraints.

Public Comment and Wrap Up

There was no public comment.

Steve Barrager closed the meeting by congratulating the SAT members on a great meeting and reminded them that a SAT representative was still needed for the BRTF meeting on September 29 2005.

Upcoming Meetings

The next SAT meeting will be held October 18, 2005 in San Luis Obispo, CA.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Tuesday October 18, 2005
10:00 a.m. - 4:30 p.m.

Apple Farm - Harvest Room
2015 Monterey Street
San Luis Obispo, CA 93401

This meeting will be videotaped for future viewing on the Internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Discuss and adopt prioritized list of central coast species likely to benefit*
- *Review draft network design presentation, discuss, edit and revise*
- *Discuss criteria, process, and tools for MPA evaluations*
- *Review and discussion of questions from CCRSG*

10:00 a.m. **1. Welcome, review of agenda, and recent updates**
Steve Barrager, Chair, MLPA Master Plan Science Advisory Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA / Nearshore Ecosystem Coordinator, California Department of Fish and Game

10:15 a.m. **2. Species Likely to Benefit List** – *Doyle Hanan*
A. Presentation of proposed list and criteria
B. SAT discussion and modifications to list
C. Adoption of list to forward to CCRSG and BRTF

11:30 a.m. **3. Draft Presentation; Network Design** – *Steve Gaines*
A. Presentation by Steve Gaines

12:00 p.m. **Lunch** – Provided for SAT members and staff onsite

1:00 p.m. **3. Continued - Draft Presentation**
B. SAT Discussion and edits to presentaion

2:00 p.m. **Break**

2:15 p.m. **4. Evaluating MPA Packages -** *John Ugoretz*
A. Demonstration of potential concepts
B. Review concepts and discuss options for proposal evaluation
C. Tool needs for SAT support

3:15 p.m. **5. CCRSG Meeting Review -** *Mark Carr, Dean Wendt*

A. Review of results of meeting
B. Review questions from the stakeholder group and potential answers

3:45 p.m. **6. Future Presentations and Needs** – *Steve Barrager*

A. Possible additional presentations (Berkeley BOFFs, MPA Monitoring)
B. Other upcoming issues

4:00 p.m. **7. Wrap up and Public Comment**

Public comment will be limited to time available at the discretion of the SAT Chair.

A. Upcoming Meeting Dates - Should we continue alternating sites?
    a. November 15 - Santa Cruz
    b. January 20, 2006 - Location TBD
    c. March 2, 2006 - Location TBD
    d. May 1, 2006 - Location TBD
B. Public Comment

4:30 p.m. **Adjourn**

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
OCTOBER 18, 2005 MEETING SUMMARY
Apple Farm - Harvest Room
2015 Monterey Street
San Luis Obispo, CA 93401

SAT members present: Mark Carr, Steve Gaines, Doyle Hanan, Linwood Pendleton, Susan Schlosser, Astrid Scholz, Dean Wendt, Mary Yoklavich

SAT members not present: Loo Botsford, Rikk Kvitek, Steven Murray, Mark Ohman, Jeff Paduan, Stephen Palumbi, Dave Schaub, Kenneth Schiff, Rick Starr, William Sydeman

Others present: Steve Barrager (SAT Chair), Heather Galindo (note taker; SAT support staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), John Ugoretz (DFG staff), Tom Barnes (DFG staff) and approximately 10 members of the public

Acronyms used: California Department of Fish and Game (DFG); California Nearshore Fishery Management Plan (NFMP); fraction of lifetime egg production (FLEP); geographic information system (GIS); marine protected area (MPA); MLPA Blue Ribbon Task Force (BRTF); MLPA Central Coast Regional Stakeholder Group (CCRSG); MLPA Central Coast Science Sub-Team (CCSST); MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT); Monitoring, Evaluation, and Adaptive Management Framework (MEAMF); optimum yield (OY); state marine conservation area (SMCA); state marine park (SMP); state marine reserve (SMR); total allowable catch (TAC)

Welcome, Review of Agenda, and Recent Updates

Steve Barrager welcomed the SAT and reviewed the agenda for the meeting. He announced that the CCRSG was actively assembling MPA proposal packages and that all proposals from outside the CCRSG are due on October 15, 2005.

John Kirlin then welcomed the SAT and thanked those who had given SAT presentations at the October 2005 CCRSG meeting. He followed by saying that the CCRSG had developed over 100 individual MPA concepts and formed good working relationships. An additional set of CCRSG meetings will be held on October 20, 2005 in both the north and south areas of the central coast. The goal of these meetings will be to further refine MPA concepts and group the individual concepts into arrays for MPA proposals. John explained that the MLPA Initiative staff has already received proposals from both outside groups and individuals. These will be presented to the CCRSG. John added that the MLPA Initiative staff has begun drafting a plan for MPA monitoring and evaluation with input from members of the MLPA Central Coast Science Sub-Team (CCSST). John Kirlin ended by announcing that the BRTF had adopted the MLPA Central Coast Regional Profile and, after deciding on unresolved issues, adopted the goals and objectives package developed by the CCRSG at its last meeting.

John Ugoretz followed by explaining the 100 individual MPA concepts had to be packaged into full proposals by the CCRSG in a relatively short amount of time. He emphasized that the SAT needed to have a good discussion about how to evaluate the proposals. John Ugoretz finished

by introducing Tom Barnes of the San Diego office of DFG, who he invited to give input on fisheries issues and development of the species likely to benefit list.

Species Likely to Benefit List

Doyle Hanan and Mary Yoklavich opened the discussion by updating the SAT on recent progress on the text document accompanying the list of species likely to benefit from MPAs. During a conference call and some additional work, the sub-team developed a list of criteria and species to be included. The species included in the list should meet one or more of the criteria:

- Species occurs on the central coast
- Species has small to moderate adult neighborhood size
- Species experiences moderate to large take
- Status of species is known to be low or declining
- Status is unknown, but species shares a life history or co-occurs with a declining species
- Species has a life stage that may benefit from an MPA (e.g. as a breeding, feeding, or nursery ground)
- Species size structure is smaller due to fishing
- Species habitat is impacted by fishing

Initial comments on the text:

- Discussion about whether the criteria involving a shift to a smaller size structure should contain the phrase “due to fishing” since such a shift could be due to other causes including high recruitment. Suggestion to change the phrase to “due to take”.
- Indirect effects on species are not explicitly listed in the criteria except for the one involving habitat destruction, but they are discussed elsewhere in the text document. Some of these indirect effects include habitat damage and destruction, disturbance, species interactions, trawling and dredging, and the presence of people.
- Text had been included discussing birds, mammals, and turtles that meet the above criteria. This text was reviewed by a non-SAT expert in addition to the SAT sub-team.
- A matrix was created evaluating each species on the list for each of the criteria. The matrix is partially filled in, but more work needs to be done.
- Information about bottom type associated with each species is listed as either rock or sand. Depth range of species comes from a literature review done by students at the Bren School at UC Santa Barbara.
- Discussion about whether evaluation of species for each criteria should result in a “yes” or “no” entry to the matrix or if some finer ranking system is more appropriate. It was agreed that the former should be used because there are not good data for many of the species to support a finer ranking system.

- Potential for the list of species to be prioritized based on the number of "yeses" in response to the criteria. Alternatively, the list could be reorganized by which species meet each of the criteria. Some SAT members felt the list should not be prioritized since all of the species included are likely to benefit from MPAs in some way.
- The response of species to changes in water quality was not included in the criteria because the MLPA Initiative process does not address water quality.
- Small and moderate adult neighborhood sizes should be defined as being smaller than and equal to the SAT guidelines in the MPF, respectively.
- How should moderate to large take be defined? How should historical take be taken into account? What about species with currently low, but increasing population sizes?
- In some cases it is difficult to parse out effects on species due to changes in fishing regulations versus implementation of an MPA.
- Using the current state of a fishery as a criterion could be problematic since the status can change over time. However, the MLPA process is already designed to be adaptive.

John Kirlin clarified that species protection is one of the five goals of the MLPA and the list of species likely to benefit has at least three major roles: to aid the stakeholders in designing their MPA proposals, to aid the SAT in evaluating the proposals, and to provide information for future adaptive management processes.

John Ugoretz suggested that the SAT sub-team should work to complete the matrix of criteria and species then circulate the draft to the whole SAT with the goal of having a draft ready for the November 9-10, 2005 CCRSG meeting.

Tom Barnes from DFG gave a short presentation to the SAT about the interaction of fisheries management and MPAs. The presentation contained the following main points:

- Many of the finfish species on the draft species likely to benefit list are currently actively managed under the California Nearshore Fishery Management Plan (NFMP) and the Groundfish Management Plan.
- The process of drafting the NFMP in 2000-2001 involved consideration of how MPAs might affect optimum yield (OY) or total allowable catch (TAC). Due to a lack of previous examples, analogous situations in other California fisheries were used for comparison including the cowcod and rockfish conservation areas plus *de facto* closed areas (e.g. areas far from ports or where the bottom habitat is not conducive to fishing). In no case was OY reduced because of the closed areas. In part, this is due to the fact that recruitment from closed areas may supplement the populations in fished areas.
- Based on a graph of allowable catch under both the Pacific Fisheries Management Council and NFMP guidelines versus stock size, OY should not need to be adjusted unless more than 20% of the stock is unavailable to the fishery. This allows stock assessments to be done on the entire stock and does not require adjustments to OY if less than 20% of the stock is protected by MPAs.

- For unassessed stocks, maximum sustainable yield or allowable biological catch is based on recent catch and OY is set to half that amount. In general, this allows for conservative management of unassessed stocks, although there can be exceptions.

Discussion following the presentation involved the following main points:

- Areas such as the Cowcod Conservation Area were designed to protect Cowcod populations, but not to influence TAC or OY for other species.
- Agreement that there is a clear precedent for closures not requiring adjustments in TAC. Strong biological evidence would be required for adjustments to be made to the TAC.
- Reminder that the MLPA is not required to take fisheries management into account. It is also unlikely, but possible, that fisheries management will have to respond to MPA implementation.
- TAC is based on long-term averages of stock assessments and often has quite high confidence intervals. It would be worthwhile to track fluctuations in stock assessments over time and space.

Draft Presentation: Network Design

Steve Gaines gave a draft presentation on the concept of network design assembled with the help of other SAT members:

- MLPA was a landmark act in requiring a network of MPAs.
- Since the passage of the MLPA, other MPA networks have been designed or are currently in the planning process:
    - Channel Islands MPA network.
    - South Africa aims to have 20% of the entire coastline in MPAs by end of the decade.
    - About 33% of the Great Barrier Reef is currently designated as marine reserves.
    - Gulf of California, Cuba, and New Zealand all have planning efforts underway.
- What is a network?
    - Network is a term used in many fields with different meanings.
    - Analogous to social and computer networks whose function depends on the connections in the network.
    - Ecological networks: The connections are relatively linear for coastlines and exist through movement of individuals.
- Why bother?
    - The goal of creating sustainable populations could be achieved with a large single MPA. In general, the size of an MPA should be greater than the average scale of movement for any life stage. This reasoning has long been used in designing terrestrial parks.

  - However, there is enormous variation in distances species move and an MPA designed to accommodate this range of distances would be overkill for many species, would provide little fisheries benefit, and would provide no help to species with a range outside of the MPA.
  - Multiple smaller MPAs will not protect species whose adult range exceeds the size of individual MPAs, but will allow larvae a greater chance of settling inside an MPA. Therefore, guidelines for MPA size are based on movements of adults and larvae with small dispersal distances. Guidelines for MPA spacing are based on medium to long-range dispersal distances.
  - Much of MPA design theory could benefit from quantitative field studies.
  - Loo Botsford's model for fish shows that the fraction of lifetime egg production (FLEP) must be 35% or greater for a population to be sustainable. FLEP decreases as the distance between MPAs in a network increases.
  - In general, although there are tradeoffs, the benefits of MPA networks outweigh the drawbacks. Compared to a single large MPA, networks require less area, offer more flexibility, help to maintain genetic diversity, provide insurance against catastrophes, and minimize socioeconomic impacts.
- What should a network look like?
  - Examples of arbitrary spatial configurations were given.

Feedback on the presentation was as follows:

- Presentation should include some discussion of how MPA network design is relevant to fisheries.
- There were several comments about small changes to graphics or color schemes used in the slides and a few suggestions regarding use of language. In particular, the slides for the FLEP model results could benefit from a more dramatic color scale to indicate differences in results.
- An explanation would be useful that in order to see a network effect for species with high dispersal distances, more than two MPAs need to be included in the FLEP model.
- Multiple MPAs would keep multiple habitats open to and reduce travel costs for fishermen while minimizing other socioeconomic impacts, but still protect the geographic range of a single large MPA. An actual network is required to maintain genetic diversity and provide insurance against catastrophe.
- Larvae settling in MPAs are important because they will have a greater chance of becoming reproductive adults than outside MPAs.
- There should be more discussion of mobile versus sessile life stages (including juveniles) and species.
- There is potential for animals to actively stay within MPAs, especially if they cue into prey density. This is also more likely if MPA and habitat boundaries coincide.
- The presentation implies that overfishing is occurring outside the MPAs. In terms of the FLEP model, Steve clarified that although there is egg production outside of MPAs, it

may not constitute the 35% required for a sustainable population. In addition, MPAs can harbor bigger, more reproductive individuals and populations with higher genetic diversity that are not subject to selective fishing pressure. MPAs help insure sustainability of populations.

- Although the MLPA might be leading the way in requiring MPA networks in legislation, there are other examples emerging all over the world. These networks will allow for rigorous scientific testing of the theory behind MPA network design.
- The slide depicting the number of species with a particular average dispersal distance might be misleading because it is on a log scale. In fact, many fished species tend to fall within a fairly narrow range of dispersal distances.
- It might be helpful to indicate which dispersal distances would be encompassed by an MPA network conforming to the minimum and maximum of the SAT recommended size and spacing guidelines.
- The slide listing scientific research on additional benefits of MPAs should indicate that these fields are on the cutting edge of science.
- It is important to include other aspects important to network design such as habitat. As it stands, the presentation is largely focused on individual species and dispersal distances.
- A discussion of uncertainty should be included especially concerning the biological and socio-economic impacts of having multiple MPAs either networked or non-networked.
- The presentation emphasizes design at an ecosystem level, but it is worth considering whether the approach to designing MPAs for a single species would be different.

Evaluating MPA Packages

Steve Barrager opened the discussion on evaluating MPA packages by introducing the concept of a fictitious straw man MPA package the SAT could use to help them develop evaluation criteria. He encouraged the SAT to evaluate the strengths and weaknesses of the straw man package and to determine what information about the package was necessary to do the appropriate evaluation.

John Ugoretz then presented an overview of the straw man package emphasizing different examples of MPA size, spacing, and type arbitrarily chosen to stimulate ideas about evaluation approaches. He reminded the SAT that other things to consider were the shape of MPAs to facilitate practical enforcement and that fishing vessels could transit through or anchor in an MPA with catch on board, but some sites may alter the transits of vessels with gear in the water. John emphasized that the only take allowed in a marine reserve was some collecting for scientific or educational purposes, although collecting permits can still exclude certain areas. If any other take is allowed, then the MPA cannot be designated a marine reserve.

Main discussion points concerning the evaluation of the straw man package were as follows:

- Good biogeographic representation via a spread of MPAs throughout the study region is important.

- The presence of adjacent MPAs of different types will be important for evaluation of MPA performance and future adaptive management. (John Ugoretz mentioned that few proposals for marine parks had been raised in the previous stakeholder discussions.)
- It is important to develop measurable criteria to evaluate whether an MPA package meets its stated goals and objectives.
- A potential evaluation framework could include the following questions: 1) What goals are being addressed? 2) What are the potential costs of meeting these goals? and 3) What are the alternatives and their costs?
- Acknowledgement that not all evaluation criteria will be quantitative and evaluation of some goals and objectives may not involve science questions and would therefore fall outside the purview of the SAT. The SAT's role is to consider the pros and cons of each MPA package, but not necessarily to rank them.
- If a design does not meet a particular objective, it would be useful to provide feedback about how the design might be altered to meet that objective.
- A memo to the stakeholders should be included with the species likely to benefit list indicating how the list will be used in the evaluation process.
- Some MPAs should include deep-water habitats.
- Some objectives might be conflicting (e.g. MPA shapes taking into account habitat protection and ease of enforcement).

Requested data for evaluation of the actual stakeholder packages include:

- The type and value of fisheries in each area would facilitate an evaluation of the socioeconomic impact of particular MPAs.
- Geographic distances between habitat types taking into account both bottom type and depth.
- Geographic distances between MPAs of a certain type (i.e. reserve, park, or conservation area).
- Proximity of MPAs to educational institutions, educational opportunities, and monitoring facilities.
- A data layer indicating location of roads and public transportation routes.
- Information for the distribution of species on the species likely to benefit list that should include a column indicating ecological importance.
- The rigor and level of review of each dataset should be indicated.
- Stakeholders should indicate how their design meets objectives, but are not required by the MPF to indicate how they weighted the various objectives.

Satie Airame from UC Santa Barbara presented a summary of the efforts of students at the UCSB Bren School to translate the MPA objectives into measurable criteria. The project involves creating a table indicating which of the available GIS data layers can be used to evaluate MPA packages for fulfillment of each objective or design consideration. Preliminary

work indicates that not all objectives are equally supported by the data layers with objectives 3.1, 3.3, 3.4, and those under goal 6 having the least data layer support.

Satie explained that analyses could be done to determine how the maximum number of goals could be met while minimizing the size of individual MPAs. This tool could be used to help evaluate the packages by determining how often a particular area is indicated in analyses with different objectives. These areas common to several analyses could then be compared to MPA proposal packages as one aspect of the evaluations. The SAT requested separate analyses considering the SAT recommended habitats and CCRSG recommended habitats. Other analyses should include species distributions and proximity to population centers.

It was decided that the SAT Monitoring and Evaluation Sub-Team would work with Satie to develop measurable evaluation criteria which could then be reviewed by the entire SAT.

CCRSG Meeting Review

Mark Carr summarized the first day of the October CCRSG meeting as being focused on evaluating existing MPAs in the central California study region. John Ugoretz followed by explaining that the second day consisted of four small groups having very productive brainstorming sessions. John added that the stakeholders discussed and evaluated proposals for candidate MPAs by considering both pros and cons in a reasonable manner.

Mark Carr then reported on the questions for the SAT raised at the October CCRSG meeting. The main question involved the impact of non-extractive human activities in marine reserves on biological communities. Heather Galindo followed by explaining a short list of relevant references was being assembled by the CCSST and a draft answer to the question would be submitted to the entire SAT for review via email. Heather also explained that MLPA Initiative staff is drafting an answer for another question on Pismo Clams and she would try to circulate a draft of that response to the SAT as well.

Future Presentations and Needs

John Ugoretz briefly summarized the several ongoing efforts having to do with MPA monitoring and evaluation. MLPA Initiative staff will be holding a non-public meeting on November 1, 2005 to develop a framework for the process of monitoring and evaluating MPAs. Previous efforts included work by MLPA Initiative staff on creating the monitoring and evaluation matrix document and a presentation from Charles Wahle of the National MPA Science Center at a CCRSG meeting. John indicated that input from people currently involved in MPA monitoring would be valuable. Mark Carr added that he would present a draft presentation on monitoring and evaluation at the November 15, 2005 SAT meeting.

John Kirlin then directed a brief discussion on whether to have Steve Berkeley give a science presentation to the BRTF. Feedback from the SAT indicated that while Steve Berkeley's work on rockfish is important to the concept of MPA design, it had been well covered in a previous SAT presentation and is focused on a single species. In addition, future time in the BRTF

agenda should first be given to developing SAT presentations on networks, monitoring and evaluation, water quality, and socioeconomics.

John Ugoretz then proposed future meeting dates for the SAT:

- January 20, 2006
- March 2, 2006
- May 1, 2006

John added that an additional SAT meeting after May 1, 2005 may be required to address public comment or feedback from the California Fish and Game Commission. The SAT had a brief discussion about meeting locations and proposed alternating future SAT meetings between San Jose, CA and San Luis Obispo, CA.

Wrap Up and Public Comment

Public comment was made by one individual asking the SAT to consider animals other than fish for the species likely to benefit list, including sea cucumbers, lobsters, moon snails, and abalone. He also reminded the SAT that, under the CCRSG's goal 5, objective 1, both positive and negative impacts of MPAs must be considered. He closed by saying that information relevant to goal 3 has not been included in the data layers available to the CCRSG, but instead was being provided by two of the stakeholders.

Upcoming Meetings

The next SAT meeting will be held on November 15, 2005 in Santa Cruz, CA.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Tuesday November 15, 2005
10:00 a.m. - 4:30 p.m.

National Marine Fisheries Service, Santa Cruz Lab
110 Shaffer Road, Santa Cruz, CA 95060

This meeting will be videotaped for future viewing on the Internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Adopt list of central coast species most likely to benefit and key species from list*
- *Evaluate preliminary marine protected area (MPA) array packages from the MLPA Central Coast Regional Stakeholder Group (CCRSG)*
- *Discuss monitoring, evaluation and adaptive management framework*

10:00 a.m. **1. Welcome, review of agenda, and recent updates**
Steve Barrager, Chair, MLPA Master Plan Science Advisory Team
John Kirlin, Executive Director, MLPA Initiative
John Ugoretz, MLPA and Nearshore Ecosystem Coordinator, California Department of Fish and Game

10:15 a.m. **2. Species likely to benefit list** – *John Ugoretz*
A. Presentation of proposed list and document
B. Need for clear direction to CCRSG - including key species
C. Adoption of list to forward to CCRSG and MLPA Blue Ribbon Task Force

11:00 a.m. **3. Initial MPA array packages** – *John Ugoretz and Mary Gleason, Principal Planner, MLPA Initiative*
A. Overview of the proposals

12:00 p.m. **Lunch** – Provided for SAT members and staff onsite

1:00 p.m. **3. Initial MPA array packages** – continued
B. Broad scale overview
C. How well do proposals meet the MPF guidelines?
i. Metrics for applying the guidelines
D. How well do proposals meet the CCRSG goals and objectives?

2:00 p.m. **Break**

2:15 p.m. **3. Initial MPA array packages** – continued
- E. Relative importance of different metrics
- F. How to report back to CCRSG
  - i. Assistance needed
  - ii. Format of report

3:30 p.m. **4. Monitoring, evaluation, and adaptive management framework -** *Tegan Churcher Hoffmann, Principal, T.C. Hoffmann and Associates*
- A. Review proposed outline for monitoring framework
- B. Discuss SAT input into the framework and process

4:00 p.m. **5. Wrap up and Public Comment**
Public comment will be limited to time available at the discretion of the SAT Chair.

4:30 p.m. **Adjourn**

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
NOVEMBER 15, 2005 MEETING SUMMARY
National Marine Fisheries Service, Santa Cruz Lab
110 Shaffer Road
Santa Cruz, CA 95060

SAT members present: Loo Botsford, Steve Gaines, Rikk Kvitek, Steven Murray, Stephen Palumbi, Susan Schlosser, Rick Starr, Dean Wendt, Mary Yoklavich

SAT members not present: Mark Carr, Doyle Hanan, Mark Ohman, Jeff Paduan, Linwood Pendleton, Dave Schaub, Kenneth Schiff, Astrid Scholz, William Sydeman

Others present: Steve Barrager (SAT Chair), Michael DeLapa (MLPA staff), Evan Fox (MLPA staff), Heather Galindo (note taker; SAT support staff), Mary Gleason (MLPA staff), Tegan Hoffman (MLPA consultant), Carrie Kappel (note taker; SAT support staff), John Kirlin (MLPA staff), Paul Reilly (DFG staff), Paulo Serpa (DFG staff), John Ugoretz (DFG staff) and approximately 15 members of the public

Acronyms used: California Department of Fish and Game (DFG), fraction of lifetime egg production (FLEP), geographic information system (GIS), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Central Coast Regional Stakeholder Group (CCRSG), MLPA Central Coast Science Sub-Team (CCSST), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT), Monitoring, Evaluation, and Adaptive Management Framework (MEAMF), state marine conservation area (SMCA), state marine park (SMP), state marine reserve (SMR)

Welcome, Review of Agenda, and Recent updates

Steve Barrager welcomed the SAT members and began by congratulating them on having their design guidelines successfully incorporated into the process. He added that the stakeholders and others are anticipating feedback from the SAT over the next few months. Now that a set of MPA proposals have been submitted for the central coast, the SAT will be asked to provide preliminary feedback and develop a plan for further evaluation. Steve then reviewed the agenda for the day's meeting.

John Kirlin followed by thanking the SAT members for their participation and emphasizing the importance of the day's meeting.

Species Likely to Benefit List

John Ugoretz outlined the changes made to the species likely to benefit document since the last SAT meeting. Language that appeared to be biased against fishing was removed. The table should not be considered to be exhaustive and the criteria in the table are not additive. The criteria involving the shift of a species size structure to smaller individuals was removed because this information is not readily available for the bulk of the species on the list. John Ugoretz asked the SAT to decide whether a short list of prioritized species should be included in addition to the longer, more encompassing list. He noted that the central coast evaluation

sub-team had held a discussion and suggested that a short list including species of algae, plants, invertebrates, fishes, seabirds, and sea lions particularly likely to benefit be developed. Abalone and Pismo Clams should not be included on this list because the presence of otters in the central coast makes a dramatic recovery response from either of these species unlikely.

Members of the SAT responded by explaining that while information on the size and age structure of many species is not widely available, it should be included where it is available. Loo Botsford agreed to provide data for at least five fish species based on the results of his fraction of lifetime egg production (FLEP) model.

Concern about the short list of species led to a further explanation by John Ugoretz. The short list is meant to emphasize species on the full list that are of particular concern and may facilitate comparisons between MPA alternatives that are not feasible with the entire species list. He reminded the SAT that alternate versions of this short list have come up at least three times in the development of the species likely to benefit document and a final decision should be made by the SAT. Further discussion by the SAT indicated that if the criteria categories are not meant to be additive, then prioritizing certain species is in contradiction with that decision. In addition, simplification of the full list will lead to a loss of critical information such as changes in size and age structure and other criteria. John Ugoretz then asked the SAT if they would prefer to remove the short list and its accompanying text from the species likely to benefit document. He also asked the SAT to make its decision while considering whether the lack of a short list would hinder the ability to efficiently analyze the MPA packages and to understand that the stakeholders would likely not be able to pare the list down on their own. The SAT agreed to remove the short list and the accompanying text.

John Ugoretz then moved the discussion on to the matrix portion of the document. He explained that for each species a “1” indicates that a criteria is met, a “0” indicates the criteria is not met, and an “ND” indicates data are not available. A column will be added for size structure with information to be added for black, blue, brown, copper, and olive rockfish. Stock-recruitment information for other species such as cowcod might also be available. The SAT considered including both this kind of quantitative data along with qualitative data, such as evidence that the size structure of a species is smaller now than it was known to be 20-30 years ago. The latter type of data is available for species such as squid and abalone.

The SAT moved on to discuss whether or not to add structure-forming species that are particularly vulnerable to fishing gear. It was agreed that gorgonian corals, hydrocorals, sponges, and sea pens should be added to the list. Sea cucumbers should also be added if there is information about the impact of fishing on this species from central California. In general, data used to include species in the list should be peer reviewed. One last correction was made to the entry for the depth of red rock crab changing it from 250m to 750m.

John Ugoretz closed the discussion by saying that the species likely to benefit document would be presented to the CCRSG and BRTF as a working list instead of as a document upon which absolute consensus had been reached.

Initial MPA Array Proposals

John Kirlin outlined the timeline for developing and evaluating the MPA packages as follows:

- November 9-10, 2005: CCRSG produced MPA packages
- November 15, 2005: SAT will begin initial review of MPA packages
- November 29-30, 2005: BRTF will begin initial review of MPA packages
- December 6-7, 2005: CCRSG will consider initial feedback from the SAT and BRTF and will make final revisions to the MPA packages
- After December, the SAT will continue to work with the BRTF, DFG, and the Fish and Game Commission in evaluating the packages

John Kirlin went on to set the goals for the initial SAT evaluation of the MPA packages by asking the SAT to look for weaknesses in the current packages and to suggest changes to strengthen them. The evaluation process should build off the longer-term work of the SAT design guidelines and reviewing the CCRSG goals and objectives. In addition, the CCRSG has come up with a list of questions including: How does an SMCA with limited take compare to an SMR? What is the difference between having a number of small protected areas and having MPAs matching the original guidelines? How much deep water habitat should be included?

Steve Barrager then gave a short presentation suggesting a way to approach evaluation of the MPA packages. The approach involved several key components:

- Identify the key questions such as: How does a single network meet the goals and objectives? How do networks compare to each other?
- Once the questions are identified, try to imagine the final evaluation product including how it will be presented.
- Evaluation will require working definitions of the several types of MPAs.

Steve Barrager then gave examples of how the evaluation analyses of packages for particular guidelines might be presented to the CCRSG or BRTF emphasizing effective means of presenting summaries of the raw data.

In general, SAT members found the presentation useful and liked the idea of thinking about how to present evaluations based on each goal in summary fashion. More specific discussion points included the following:

- The amount of area of each habitat type should be expressed as a percentage since some habitats are rarer than others. Also, habitat categories should be consistent with the MLPA and design guidelines in the MPF. The MLPA Initiative staff will provide the amount of each habitat type in each MPA.
- A working list of MPA categories should be created. In addition to the three listed in the MLPA (SMR, SMP, SMCA), there are several possible subcategories such as areas where take of groundfish, kelp, forage fish, or benthic invertebrates is prohibited. Other areas may prohibit bottom trawling or the use of other fishing gear that contacts the

bottom. It was suggested that the working list be developed based on the MPAs proposed by the stakeholders.

- Graphics should be able to express the extent of an MPA both along a coastline and across a depth range while still taking habitat into account.
- In order to evaluate the size and spacing of MPAs, distances will be calculated as long-shore span in statute miles. A series of straight lines will be used to measure distances around headlands. Depths will be calculated as feet or fathoms. The data will be provided by MLPA Initiative staff.
- Replication of a particular type of MPA within and between habitat types is required to meet the guidelines of the MLPA and the MPF.
- Fractional changes should be used to assess impact (e.g. a certain fishery has been potentially reduced by 1%). The data from the Ecotrust study on fishing will be useful here.
- In evaluating packages for goal 3, objective 1 (for the central coast study region), it will be important to consider whether MPAs are appropriately accessible based on the objectives of that MPA. Straight line distances to the nearest access point may not capture this adequately.
- Evaluating the potential of particular packages for future adaptive management and monitoring might involve the following questions: Are there adjacent MPAs of various types that can be scientifically compared? Can some of the MPAs be used as adequate reference sites for fisheries management? Do any of the MPAs contain pre-existing monitoring sites? Are there an appropriate number of replicates of each MPA type of various sizes in a number of habitats?

After the general discussion on MPA evaluation, Mary Gleason introduced the five MPA packages that had been submitted to date. She cautioned that the packages were still under revision with some errors already noted and that more packages were likely to be submitted. Staff is working with the package designers to accurately capture the shapes of MPAs in GIS format. Packages from the CCRSG are designated with numbers while those from outside groups are lettered. Each package contains a map for the north and south section of the central coast region along with tables containing information about habitat types and the allowed uses in each MPA. Mary Gleason closed by apologizing for errors in the maps provided for Package A.

John Ugoretz then presented the packages in detail to the SAT by displaying the maps on the projection screen and indicating the location, type, and name of each MPA.

After seeing the preliminary proposals, the SAT began considering how to provide appropriate initial feedback to the stakeholders in time for their December meeting. John Kirlin reminded the SAT to consider questions such as size and spacing, protection of deep water habitats, and the efficacy of various levels of protection. Important points of discussion included the following issues:

- If take is restricted, then it is assumed all bycatch would be thrown back unless otherwise specified.
- Data on the size, spacing, and amount of habitat types in each MPA are critical for even an initial cursory evaluation. Identifying stretches of unprotected coast and levels of protection afforded by various MPA types are also important.
- Size and spacing of MPAs have to be considered together according to the SAT design guidelines (e.g. smaller reserves should be closer together while larger ones can be further apart).
- Habitat data are not as readily available in nearshore areas. For most areas, it is possible to map hard versus soft bottom habitats, although there is a tendency to overestimate soft bottom habitats. The fine and coarse scale datasets will be merged for this analysis. It would be helpful to indicate the type of data used to evaluate each MPA. There are fewer habitat data available for the area south of Big Creek.
- SAT members should consult people with expertise in various geographic areas containing proposed MPAs.
- Although there is a high degree of overlap between proposals, it is important to consider what aspects make the packages both similar and different.
- Results of a gap analysis on existing MPAs might help to evaluate how the packages fill these gaps. Among aspects missing from existing MPAs are protection of habitats deeper than 100m, of rocky habitats, and of habitats from Año Nuevo to Elkhorn Slough and again from Big Creek to Atascadero.
- Modeling can be used to evaluate how the proposed MPA arrays will affect population sustainability for species with varying dispersal distances.
- There has been a lack of scientific studies comparing the effects of marine parks or conservation areas having various levels of protection with the effects of marine reserves. The conservation benefits of a park or conservation area will depend on the type and amount of bycatch associated with allowed harvest in addition to water depth, habitat, and efficacy of enforcement. The ecological roles of either harvest or bycatch species must also be considered.
- Considering the percent of coastline covered by MPAs is supplemental, and not sufficient, to evaluating the proposal packages.
- More deep water protection can be afforded by extending some SMRs with SMCAs. However, MPAs extending to the three mile limit do not necessarily include deep water.
- Replication of marine reserves among habitats and within bioregions is mandated by the MLPA.

The SAT decided to break into smaller groups to provide some specific feedback about each proposal especially considering the major issues outlined above. Initial feedback by the SAT on the draft MPA packages was as follows:

Package 1

- The SMCA at Julia Pfeiffer Burns may adequately fill the gap between the Point Lobos and Alder Creek SMRs if only salmon is taken. However, if there is a significant amount of associated by-catch, protection may not be adequate for either pelagic or demersal species.
- Allowing for some scientific take from the Ed Ricketts SMCA for the purposes of monitoring and evaluation, but not large scale scientific or educational take, would meet the objectives concerning monitoring and evaluation of MPA performance.
- Many of the proposed MPAs around the Monterey Peninsula already exist, but there is a large increase in the Point Lobos area due to the proposed SMCA.
- There is limited protection of deep water habitats in the form of SMRs.
- Most protection in the southern area of the central coast study region is only for demersal species.
- There is little intertidal protection in the southern central coast study region.
- The largest reserve is only four miles in length.

Package 2

- The four MPAs at Año Nuevo are disjointed and could be simplified by creating one SMR and one SMCA in the area in order to protect forage fish for seabirds and groundfish.
- An MPA only protecting the intertidal does not have conservation benefits for sub-tidal and pelagic communities.
- There is a lack of SMRs in deep water. Both SMRs and SMCAs in deep water should be included. This will allow for a scientific evaluation of the relative biological effects of SMRs and SMCAs that allow salmon and spot prawn fisheries.
- MPAs at Point Lobos should encompass the entire Yankee Reef to ensure conservation benefits and allow for adequate scientific monitoring.

Package 3

- There are no marine reserves south of Point Buchon.
- There is good size and spacing for most MPAs. In addition, many of them extend to the 3-mile limit of state waters and afford some deep water protection. If suitable habitat is captured, there should be adequate network effects.
- There are few MPAs between Cambria and Purisima Point with none extending into deeper waters.
- The intended function of small SMRs (less than three miles in length) is unclear.
- Estuaries at Elkhorn Slough and/or Morro Bay should be included because they serve as important nursery and adult habitats for many species.

- More consideration should be given to areas around headlands in the southern region because of their link to zones of upwelling and larval retention.
- Many of the SMCAs in this package will likely function as SMRs if by-catch is limited.

Package A

- There are a small number of large reserves with adequate spacing.
- Año Nuevo SMCA may provide adequate protection as long as there is limited by-catch from the salmon fishery.
- Sand Hill Bluff SMR has adequate size, spacing, and habitat.
- Soquel Canyon SMCA and Portuguese Ledge SMR capture good habitat and are of adequate size.
- Elkhorn Slough SMR and Morro Bay SMR give protection to both of the two estuarine areas in the Central Coast study region, areas known to serve as important nursery grounds for coastal species.
- All SMRs around the Monterey Peninsula together cover 5.5 square miles (including Point Lobos SMR).
- Monterey Shale Beds SMP and Carmel Bay SMP seem to have little conservation value because of allowed fishing levels.
- The large Big Sur SMR supports the spacing between the Monterey Peninsula and Point Sur MPAs and encompasses the depth range out to three miles.
- The Piedras Blancas SMR will likely protect a lot of rocky habitat based on topography and kelp distributions.
- Either the Point Buchon SMR or Cambria SMR should be extended with an SMCA to the 3-mile state limit to fill in the gap in deep water protection between Piedras Blancas SMR and Point Sal SMR.
- Point Arguello SMCA is of adequate size and is appropriately spaced from other MPAs.
- This package does a good job of including submarine canyon heads and thus protecting deep water habitats.
- This package also does a good job of targeting headlands and points for protection, areas likely to support high biological productivity. Because headlands and points are more exposed to coastal current regimes, they are also likely to act as good source locations for enriching adjacent unprotected areas and facilitating connectivity within the MPA network.

Package B

- The SAT noted that the one large SMR proposed for the entire study region would generate an extraordinary socioeconomic impact, and that similar ecological benefits could be achieved with a collection of smaller reserves (6-12km) spaced along the coast (50-100km), consistent with the guidelines in the MPF.

The SAT closed the discussion by creating sub-teams to focus on the following evaluation tasks:

- Analysis of proposed networks by habitats based on data available from MLPA Initiative staff – Steve Gaines (lead).
- Analysis of how proposed networks affect the sustainability of populations in terms of size, spacing, location and dispersal distances – Loo Botsford (lead), Steve Gaines.
- Detailed analysis of the ecological values of individual MPAs – Rick Starr and Mary Yoklavich (leads).
- Evaluate changes in level of protection between the existing MPAs and the proposed arrays – Paul Reilly (lead), MLPA Initiative staff.

Monitoring, Evaluation, and Adaptive Management Framework

Tegan Hoffman, consultant to the MLPA Initiative, gave a brief presentation on the plans for the Monitoring, Evaluation, and Adaptive Management Framework **(**MEAMF). During a meeting in August 2005, staff worked on an outline for a monitoring plan. The intent is for the plan to consider several scales, from the central coast to the entire state, and from single MPAs to MPA networks. At all scales, it is important to think about monitoring in terms of meeting the guidelines and objectives of the MLPA. Tegan broke the plan down into four major categories:

1. Overview of MEAMPF: Structure, organization, and management.
2. Adaptive management at the ecosystem scale: Linking goals and objectives together at various scales along with the decision making process.
3. Statewide oversight and management: Organizational structure, intellectual property rights, quality control, and related issues.
4. Regional implementation plan.

Tegan then asked the SAT for specific feedback in the following areas in time to be presented to the BRTF in January:

- Identifying key scientific questions related to adaptive management at the ecosystem or biogeographic level. These questions will be critical for the implementation of the MPA networks.
- Feedback on the indicators for the CCRSG goals and objectives, especially concerning the spatial and temporal aspects of data collection and monitoring.

SAT members responded by saying that in order to provide that kind of feedback, it's important to know if the issues are being approached from the standpoint of ecology or resource management. In addition, much more is known about the integrity and function of populations than for ecosystems. A starting point may be to think about ecosystems as a group of populations. Clearly defining what a network is and how the components of a network are connected is also important. Knowing about dispersal distances is important, but simply

looking at whether the overall number of species is increasing may not indicate that the network is functioning. It is also important to take into account the persistence of populations and changes in community trajectories over time.

The SAT decided that a sub-team would be formed to work with Tegan Hoffman in drafting an initial list of key questions and providing feedback on the monitoring and evaluation indicators. The work products would then be circulated to the SAT for further review before feedback was presented to the BRTF.

Wrap up and Public Comment

Public comment was offered by four members of the CCRSG:

- The fishermen appreciate the work the SAT is doing and encourage the group to look closely at the rationales provided with the MPA proposal packages. It would also be helpful if the SAT could somehow prioritize some of the species on the species likely to benefit List. Finally, since it is ultimately the interplay between MPAs and harvest rates that will affect populations, any scientific analyses of these interactions would be appreciated.
- It would be helpful to the stakeholders to have more quantitative answers from the SAT on issues such as the recommended amount of deep water habitat protection, the conditions under which an SMCA can provide the same benefits as an SMR, and the tradeoffs between recreational and commercial fishing. More quantitative answers would facilitate cooperation between stakeholders with conflicting interests.
- If biological information is not available or applicable to MPAs near the Monterey Peninsula, then the SAT should be able to offer socioeconomic input.

Upcoming Meetings

The next SAT meeting will be January 20, 2006 in San Jose, CA.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
DRAFT MEETING AGENDA

Friday January 20, 2006
9:00 a.m. - 4:30 p.m.

San Jose State Building, Alquist Auditorium
100 Paseo de San Antonio, San Jose, CA 95113

This meeting will be videotaped for future viewing on the Internet. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Hear and discuss presentations of MPA package evaluations for BRTF meeting*
- *Discuss staff and SAT sub-team evaluation of MPA packages*

9:00 a.m. **1. Welcome, review of agenda, and recent updates**
Steve Gaines, John Kirlin, and *John Ugoretz*

9:15 a.m. **2. Trial run of staff and SAT analysis of MPA packages presentations to the BRTF**
A. Summary of packages – *Mary Gleason*
B. How SAT evaluated packages in relation to MLPA goals – *Steve Gaines*
C. How packages address MLPA Goals 1 and 4 – *Mark Carr*
D. How packages address MLPA Goals 2 and 6 – *Steve Gaines*
E. Ecotrust analysis of potential commercial and recreational fishery impacts of packages – *Astrid Scholz*

11:00 a.m. **3. Detailed analysis of MPA packages and discussion** – *Mark Carr and SAT members*

12:30 p.m. **Lunch** – Provided for SAT members and staff onsite

1:30 p.m. **4. Continuation of discussion of analysis of packages**

3:00 p.m. **Break**

3:15 p.m. **5. Wrap up**
Provide a clear outline of next steps to prepare for the BRTF meeting, to help ensure that the SAT presentation is educational and informative.

4:00 p.m. **6. Public Comment**
Public comment will be limited to time available at the discretion of the SAT Chair.

4:30 p.m. Adjourn

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
JANUARY 20, 2006 MEETING SUMMARY
San Jose State Building, Alquist Auditorium
100 Paseo de San Antonio
San Jose, CA 95113

SAT members present: Loo Botsford, Mark Carr, Doyle Hanan, Steven Murray, Jeff Paduan, Linwood Pendleton, Kenneth Schiff, Astrid Scholz, Rick Starr, Dean Wendt, Mary Yoklavich

SAT members not present: Steve Gaines, Rikk Kvitek, Steve Palumbi, Kevin Piner, Dave Schaub, Susan Schlosser, William Sydeman, Richard Young

Others present: Dr. Steve Barrager (SAT consultant), Michael DeLapa (MLPA staff), Heather Galindo (note taker; SAT support staff), Carrie Kappel (note taker; SAT support staff), John J. Kirlin (MLPA staff), Dr. Mary Gleason (MLPA staff), Paul Reilly (DFG staff), John Ugoretz (acting SAT chair; DFG staff) and approximately 15 members of the public

Acronyms used: California Department of Fish and Game (DFG), California Fish and Game Commission (F&GC), fraction of lifetime egg production (FLEP), Marine Life Protection Act (MLPA), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT), state marine conservation area (SMCA), state marine park (SMP), state marine reserve (SMR), state marine recreational management area (SMRMA)

Welcome, review of agenda and recent updates

John Ugoretz and John Kirlin thanked the SAT for their work in reviewing the packages that the SAT received in late December. They also acknowledged the huge amount of work done by the CCRSG, the package proponents, and MLPAI staff. They highlighted the fact that the process is at a critical juncture. The packages and SAT evaluation of them will be discussed by the BRTF January 31 – February 1 in Morro Bay. The task force will then have its final deliberations about the packages in mid-March. The focus of today's meeting will be on articulating and distilling down high level, big picture insights from SAT evaluation of the packages for communication to the BRTF.

Frameworks for SAT Report on Packages to BRTF

Initial identification of high level differences among the packages

Key differences and similarities among the packages identified by SAT members include:

- Most of packages focused on shallow rather than deep habitats.
- All packages left out sandy beaches in subregion 2, Capitola to Monterey.
- All packages potentially impact commercial and recreational fisheries, but they do so unevenly. Package 1 is relatively more successful in having lesser impacts on the well-represented fisheries within the stakeholder group. Less well-represented user groups (i.e., fisheries that were not represented on the CCRSG) were potentially more impacted.

It was mentioned that the desire of CCRSG members to reach consensus may have resulted in some areas being left out that otherwise might have been included, because stakeholders felt they were important.

Trial Run of Staff and SAT Analysis of MPA Packages Presentation to BRTF

How SAT evaluated packages in relation to MLPA goals

Mark Carr gave an overview of the draft evaluation process to date. SAT members have aimed to assess how well the packages meet the *science-based* goals of the MLPA (i.e., goals 1, 2, 3, 4, and 6). Implicit in this assessment is evaluating how well the packages meet the SAT's science guidelines that are part of the MPF.

The analyses that have been conducted so far, which should be considered initial draft assessments, include:

1. Mary Yoklavich, Rick Starr and Mark Carr conducted assessments of goals 1 and 4 (ecosystem protection, habitat representation).
2. Loo Botsford and Steve Gaines conducted analyses of whether the proposed MPAs would meet goals 2 and 6, by evaluating the degree to which they function as a network and would support sustainable populations.
3. Steve Palumbi evaluated how the packages might contribute to research (goal 3), by looking at replication within the packages.
4. Astrid Scholz and Linwood Pendleton have conducted additional socioeconomic analyses.
5. Students from the Bren School have done further analysis of the socioeconomic and ecological performance of the different packages using MARXAN, but the SAT has not been involved in and is largely unaware of the details of this analysis or its outcome.

The SAT has not yet determined how well each package meets the science-based goals. These analyses are preliminary and the general approaches must be vetted by the SAT today. Based on the SAT's input, we will complete our analyses of how well the packages meet the goals. The SAT must also identify what to present to the BRTF as summary material for each analysis and the overall evaluation.

What the SAT does *not* intend to do:

- Address non-science related issues
- Analyze and compare individual MPAs
- Recommend alterations to specific MPAs
- Detail the relative merits of alternative MPAs at a particular site, unless asked specific questions by BRTF members
- Analyze package B further (rationale in text of protection level document)
- Consider federal MPAs

Summary of packages

Mary Gleason gave a brief summary of the six different packages that will be presented to the BRTF:

1. Package 0 (existing central coast MPAs)
2. Packages produced by the CCRSG (revised to take into account SAT feedback from November meeting)
    a. Package 1
    b. Package 2
    c. Package 3
3. External packages
    a. Package AC
    b. Package B

Each package includes materials provided by the proponents: maps with locations of proposed MPAs, a cover letter from the proponents, a written rationale, and a summary matrix that covers the goals and objectives, proposed regulations and species likely to benefit for each individual MPA. Along with these are materials provided by the staff: a package summary, maps, side-by-side comparison of regulations for each package, and information about the area, depth range, and habitat representation by proposed MPA designation and also by SAT level of protection (discussed further below).

In addition, several figures are included:

- Percentage of total area in region in proposed MPAs by proposed designation – parks all at <1%, packages range from 7-13% for SMCAs, 4-17% for SMRs
- Changes in packages between Nov 23 and Dec 15 versions
- Percentage of study region by SAT level of protection

To make the evaluation easier and more digestible, all analyses used the same seven subregions (see map). For the BRTF, staff have produced side-by-side maps by subregion and tried to identify areas of convergence and divergence among packages.

Ecosystem protection and habitat representation (goals 1 & 4)

Rick Starr explained the approach used to evaluation the packages' performance under goals 1 and 4. SAT members used GIS data provided by MPLA Initiative staff on lengths, areas, and habitat types under protection. They eliminated some habitats, such as pinnacles, because data were of poor quality. The team divided the analysis into subregions to evaluate habitat representation and developed a rationale for assigning protection levels.

The protection levels used by the team were:

- State marine reserve
- State marine conservation area (SMCA) high
- SMCA moderate

- SMCA low
- State marine park

Each MPA in each package was assigned one of these levels of protection. Team members then calculated the total percentage of each habitat type protected within each of the different protection levels. They then graphed the proportion of habitat protected at each level out of the total available habitat and compared those levels across eight different habitats. Some habitats were lumped (e.g. depth zones were combined within the category of shallow sand to yield two depth zones, shallow (<100m) and deep (>100m)). They then summarized the occurrence of high level protection (SMR or SMCA high) for each of the habitats in bins of 5, 10, 15 and 20% protection. A summary of how well each package meets the goals is yet to come.

Key assumptions of this evaluation:

1. Average kelp coverage data came from four years (1989, 1999, 2002, 2003)
2. Used subregions as scale for analysis, but not for presentation of results
3. Assigned protection levels based on allowed extractive activities (sewage outfalls, power plants, but mostly fishing activities)
    a. High protection
        i. SMR – no take
        ii. SMCA high – fishing for pelagics in water deeper than 50 m (depth based on scientific consensus from recent national meeting about strength of benthic-pelagic coupling)
    b. Moderate protection
        i. SMCA moderate – pelagic fishing in deeper water plus selected take of spot prawns, squid, and crab and giant kelp (by hand), fisheries with low bycatch
    c. Low protection
        i. SMCA low – any other type of extractive fishing activity (including salmon fishing in shallow water <50m, with potentially high bycatch)
        ii. SMP – recreational fishing allowed
4. Ignored small water and sewage outfalls and water intakes because effects small and diffuse relative to the size of MPAs
5. Used lowest level of protection afforded by the MPA to designate the protection level of the entire MPA (e.g. in an MPA that goes from shallow to deep water but allows salmon fishing throughout, MPA would be designated SMCAlow)
6. Lumped some habitats for simplicity
7. Evaluated packages with and without kelp harvest to examine implications of potential future changes in DFG kelp harvest policy
8. Separated hand and mechanical harvest of kelp
9. Chose to portray differences among habitats based on high protection levels (SMR and SMCA high) only
10. Created table of occurrence of 5, 10,15, and 20% of habitat protected

The figures provided in the evaluation packets illustrate:

1. Relative habitat availability across study region and within each subregion
2. Relative abundance of each habitat within each of the five MPA levels of protection for entire region and subregions. Bullets indicate log of absolute abundance of each habitat type within the subregion, so that the amount protected can be compared to the total habitat availability.
3. Comparison among the five proposed MPA packages of relative abundance of eight selected habitats across entire study region
4. Occurrence of high level protection (SMR, SMCA high) in ≥5%, ≥10%, ≥15% and ≥20% of available habitats in seven subregions for each package.

Note that including or excluding kelp harvest only made a difference in subregions 1 and 5, in which removing kelp harvest sometimes moved an MPA into the SMCA high or SMR category. It is important to identify to the BRTF that there is some effect of kelp harvest and to highlight to proponents of packages the differences that it might make.

Discussion

There was extensive SAT discussion about the assumptions and preliminary results of this analysis. In particular, the following issues were raised:

Many water quality effects were ignored in this analysis (e.g. entrainment of larvae in once-through cooling intakes of power plants, septic system runoff, etc.). Though ignoring these might make sense given the current paucity of data and the tight timeline, members of the SAT felt it was important to highlight these potential impacts for the BRTF and for future planning regions, to make it clear that more information is needed before the effects on MPA protection levels from entrainment, agricultural runoff, sedimentation, etc. can be quantified. One important variable to consider is the size of the area likely to be affected, relative to the size of the MPA. For example, local thermal effects from a cooling tank outfall might impact an SMR's effectiveness, but entrainment effects on larvae from a large power plant may go beyond the boundaries of a single MPA. Ken Schiff offered to help craft language around recommendations for future analyses of water quality effects on MPAs.

There was some concern that using these new levels of protection (SMCA high, moderate and low) in the analysis would be considered "moving the goal posts after the game is over." John Ugoretz indicated that the package proponents would be given another chance to revise packages in light of the SAT evaluation. SAT members involved in designing the analysis explained that assigning individual MPAs to these five categories allowed comparison among MPAs (and in particular SMCAs) with a wide range of differing regulations. The categories make the information easier to digest and present to the BRTF and also do a better job of capturing the subtle differences among SMCAs with different regulations that the stakeholders are trying to incorporate into their designs.

Other members were concerned that leaving out SMCA low and SMP designated areas (i.e., evaluating habitat representation only within SMR and SMCA high areas) suggests that these low to moderate protection areas are no different from no protection.

The group discussed the 50m depth rule, which was a "rule of thumb" for the depth below which pelagic and benthic communities are no longer strongly coupled, e.g. by food web interactions. This rule came out of two days of discussion in the benthic-pelagic coupling meeting in Monterey this last fall. This number is backed up by ecological information from the literature and additional information on bycatch from agencies and fishermen. SAT members who conducted this analysis were firm in applying the 50m rule, assuming that consistently applying this rule across all situations would be the most objective approach, but they realize that it is not a magic dividing line. In some cases MPAs go to 42m, and it could be more practical to move the boundary in such cases. At least one member of the SAT felt it was unfair to use the 50m dividing line to categorize an SMCA as low protection when most of the MPA is in deeper water.

In addition, Paul Reilly reported that stakeholders were concerned about the low protection level designation for SMCAs where recreational salmon fishing was allowed in waters only <50m. Some stakeholders believe that the rockfish bycatch associated with recreational salmon fishing in shallow water is much smaller than targeted harvest of rockfish. Paul Reilly mentioned that a recent DFG analysis showed that rockfish bycatch in the recreational salmon fishery is 1.5% of the total rockfish targeted harvest. Regardless of bycatch, there is also the issue of the indirect effects of harvest of pelagic species on benthic species via benthic-pelagic coupling, which is strong in shallow water. In addition, though the total level of recreational catch may be controlled, local levels of exploitation may vary greatly from place to place making it difficult to estimate local impacts of recreational fishing.

The SAT discussed a number of potential solutions to the 50m isobath problem, including giving the shallow and deeper water portions of an MPA different protection level designations for the analysis, setting a "proportion in shallow water" threshold, and giving proponents the option to designate adjacent shallow water SMRs and deepwater SMCAs in order to achieve the highest possible protection level without giving up deeper water pelagic fishing. The SAT agreed that rather than spend a lot more time increasing the resolution of this analysis, they would rather flag the issue for the BRTF when it potentially affects the results for a particular subregion or MPA. In addition, Rick Starr and MLPA Initiative staff will work to complete a full analysis of how the application of this rule and other assumptions might affect the evaluation results for one subregion (e.g. Capitola to Monterey Breakwater).

SAT members discussed where the 5, 10, 15, and 20% cutoffs came from and whether these were the appropriate bins. They discussed the possibility of using 5, 10, 20 and 40 as bins because these are the percentages that result from using the minimum and maximum size and spacing requirements from the MPF (i.e. 5 / 100 km; 5 / 50 km; 20 /100 km; 20 / 50 km). However, this assumes that habitats are distributed evenly throughout the region, when they are not. The group did agree to add one additional category, >30%, in order to capture the full range of variation in habitat representation.

SAT members discussed the fact that there is no ecological reason to assume that 5% of one habitat is equivalent to 5% of another habitat. These are merely meant to be convenient bins for more objective comparison.

SAT consensus on assumptions and suggested modifications:

1. Average kelp cover – OK
2. Subregions for analytical purposes only, not defining whether packages meet the goals or guidelines – OK
3. Protection level cutoff based on 50m isobath – OK with modification
    a. Give package proponents the chance to modify SMCAs to have higher protection at depths less than 50m
    b. Redo analysis for one example from Figure 4 (staff to work with Rick Starr).
    c. Highlight areas in Figure 4 where the 50m isobath and SMCA protection levels are an issue.
    d. Note that these analyses are in reference to goals 1 and 4, but we recognize that SMCAs address other goals as well.
4. Protection levels based on types of extractive activities allowed – Doyle Hanan, only objector – felt that protection levels were a bit arbitrary. Salmon fishing impacts in shallow water were a point of discussion.
5. Ignoring small water and sewage outfalls – OK with modification
    a. Will make statement of why this assumption was made and what the potential conflicts are (Ken Schiff to help write this)
6. Used lowest level of protection for entire MPA – OK with modification
    a. Will make statement highlighting this
    b. Will detail one example of how this might change things
7. Lumped habitats – OK
8. Evaluated with and without kelp harvest – OK
9. Different levels of protection for hand and mechanical kelp harvest – OK
10. Differences among habitats portrayed based on existence of SMR and SMCA high only – OK with modification
    a. Include footnote that states the exclusion of SMCAs and SMPs does not suggest that they have no value. For different goals, different MPAs have different values. This analysis (Table 1) is specific to goals 1 & 4.
11. Table of occurrences – 5, 10, 15, 20 and 30% habitat protected – OK with modification
    a. Add 30% as last bin so all percentages captured.
12. Discuss that these are for goals 1 & 4 only - OK

Suggestions for presentation of this analysis

- Evaluation results summarized on an overall package basis, rather than by subregions
- Brief description of process and products, focus on big picture
- Evaluation of performance with respect to guidelines – met or not?
- Evaluation of performance with respect to goals – met or not?
- Criteria for minimum habitat representation

Size and spacing (goals 2 & 6)

Mark Carr presented the evaluation that Steve Gaines undertook for size and spacing guidelines (related to goals 2 and 6). Steve calculated distances between and sizes of MPAs, categorized in different ways.

Steve compared, across different packages, the numbers of MPAs that fall within a given size range (shoreline distances which the SAT gave have been translated into square statute miles). Steve highlighted the number of MPAs that fall *below* the SAT minimum size recommendation, the number *at* the minimum size, and then those that are *greater* than the guideline. Separate figures show the results for clusters of MPAs (where a variety of different types of MPAs were proposed in close proximity to one another) and for high protection clusters (SMR and SMCA high).

Similarly, Steve analyzed the spacing of MPAs, highlighting areas that are close enough (fall within minimum spacing guideline), areas that are at the guideline distance, and areas that are beyond the guideline for maximum spacing (i.e., fail to meet the guideline). Note that when an MPA fails to meet the guideline, it breaks up the whole network. Individual problem MPAs can be identified on the included spreadsheets. Steve performed this analysis for all MPAs and for high protection MPAs only. For the high protection MPAS, there is little difference among the packages.

Steve then looked at spacing of individual habitat types within high protection MPAs. In general, connectivity was not as strong for deeper water habitats, where more of the clusters are too far apart to meet the SAT guidelines for maximum spacing.

Steve produced spreadsheets that provide further information about the size and spacing of individual MPAs. The first sheets show habitat types (rows) by proposed MPAs (columns) for each package, with cells coded by levels of protection (dark green – high, yellow – low, white – below the thresholds established for whether a habitat was considered to be included in that MPA or not – 20% for common habitats, 5% for less common habitats). Additional spreadsheets show the calculated distances between all MPAs, between high protection MPAs, and between representative habitat patches within high protection MPAs. This allows one to identify MPAs that are unconnected from others.

Finally, Steve included a graph of larval dispersal distances to illustrate which species would be able to disperse among MPAs separated by a given distance, below, within, or above the SAT guidelines for spacing. About 40% of species are able to disperse over the distances captured within the SAT range of distances (30-60 mi). Beyond that distance, <30% of species are capable of dispersing between adjacent MPAs.

Suggestions for presentation of this analysis

- Add the actual numbers of MPAs that fall within these zones in figures 1 and 2 (since many dots fall on top of each other).
- Tables 1 and 2 - change labels on both tables to say “below”, “at” and “above minimum” guideline. Add column with sample size (number of clusters).

- Figures 3 & 4 - Maybe reverse the x-axis, so that 'good' spacing is to the right as in first two figures.
- For connectivity and network function, even low or moderate protection MPAs may contribute. Need to consider the potential benefits of other types of MPAs, not just high level protection MPAs.
- Devise a way to represent habitat availability in the habitat-specific size and spacing analyses (i.e. spacing may be limited by availability of suitable habitat)?
- There needs to be a difference in the spreadsheet between an empty cell (no MPA) and one in which the habitat was too small to be counted. Spreadsheet should let you identify which of the MPAs might need to be revised. Don't need to include it in the presentation; will be most useful for proponents of packages.
- Label y-axis of graph of larval distances.
- Recommend making the point about what fraction of species are capable of dispersing over the range of distances via a bullet point rather than the graph.

Fraction of lifetime egg production (goals 2 & 6)

Loo Botsford gave a progress report on the fraction of lifetime egg production (FLEP) analysis. He stressed that he and his assistant do not yet have results ready to give to the BRTF. Their aim was to calculate the spatial distribution of persistent populations that would result from the proposed packages of MPAs in hard habitat within 0-30 m and 30-100 m depth zones. Loo showed graphs that describe how the distribution of all MPAs is related to the distribution of hard habitat along the coast in these two depth zones. He also graphed separately SMR distribution vs. hard habitat distribution in the two depth zones. In each graph, red on top = reserves, green on bottom = habitat distribution.

Next Loo showed results from simulations of FLEP for each package. For this analysis, they assumed that there are three different levels of FLEP – inside reserves over hard habitat, FLEP = 1.0, outside MPAs, no habitat FLEP = 0, outside MPAs, with habitat FLEP = 0-0.3 depending on fishery pressure. They ran simulations with this last parameter set to 0, 0.2 or 0.3 to assess the effects of different fishing pressures outside of MPAs. These analyses are based only on larval dispersal, assuming adult movement is zero. Based on previous analyses of stock recruitment data for single species, non-spatial management, they assumed that a population requires 35% recruitment in order to replace itself. Plots of equilibrium settlement show settlement levels for species with different dispersal distances – different color curves are settlement for different dispersal distances (1, 5, 15, 25 km).

Preliminary results: In shallow water (0-30m hard habitat) the existing MPAs (Package 0) are not well connected. Only short distance dispersers achieved simulated population levels above the 0.35 threshold. In deeper water (30-100m), there was some persistence for longer distance dispersers. For Package 1 in 0-30m, considering all MPAs, and FLEP = 0.2 in rocky habitat outside MPAs, there was persistence of short distance dispersers in all MPAs and longer distance dispersers in some places. When only SMRs are included, there are fewer places where medium and long distance dispersers will persist. An example short distance disperser is abalone; longer distance = rockfish, specifically kelp rockfish in shallower (0-30m) kelp habitats and vermillion, calico, and china rockfish on deeper rocky reefs (30-100+m). One can

also gauge the influence of fishing levels outside of MPAs by varying the assumed FLEP outside MPAs. Loo showed graphs of some preliminary results for this method.

This analysis lets you look at how size and spacing actually affect population persistence, taking habitat into consideration. It also helps you to relate the analysis and the packages to particular species.

Loo also plans to plot the percentage of available habitat area in which populations persist and to conduct sensitivity analyses of how changing some of the parameters (dispersal distance, fishing rate, FLEP, etc.) affects the results (e.g. how might changes in fishing regulations alter the persistence of populations?).

Suggestions for presenting these results

- Summarize these results in a table of species by packages, showing which species would be expected to persist where, based on their dispersal distances and the level of protection they receive in the different MPAs.
- Categorize about five different suites of species that represent a range of different life histories and different levels of exploitation. Make it less abstract – don't talk about parameters and values but about species and their stories.
- Make this a brief, complementary presentation to go with the size and spacing analysis that Steve Gaines produced. Loo and Steve will work together on meshing the two presentations.
- When you compare different MPA types, compare all MPAs to SMRs + SMCAhighs to make this analysis comparable to the other SAT analyses.

Discussion

For species with different dispersal distances, e.g. invertebrates and plants, which tend to have shorter dispersal distances, the results should be similar. All of this depends on the stock recruitment relationship at low population levels. Allee effects (density dependent changes in reproductive success at small population size) might change the slope of that relationship, which could alter the results, but in general results should be the same.

Potential commercial and recreational fishery impacts

Astrid Scholz presented preliminary results from the analysis of the relative potential commercial and fishery impacts of the different packages, performed by Ecotrust.

There were some updates to the evaluation package, correcting a few mistakes:

- For the commercial fisheries analysis - in Package 2 – Pt Lobos SMCA had been miscategorized as allowing salmon and spot prawn fishing, but take of these species is not allowed
- For the recreational analysis – Ecotrust had inadvertently been working with the wrong data layer. This has now been corrected and instead of angler trips, the new analysis was conducted on number of trips, recorded by block.

- Astrid will send revisions of written materials in light of these changes.

Commercial fisheries analysis methods

- Data were compiled by an Ecotrust team via interviews with commercial fleet from the ports within the central coast over this past summer.
    - 19 fisheries were identified by DFG and stakeholders as in need of additional information.
    - Asked fishermen where are the fishing grounds and how important are they to you? In some cases, e.g. for the salmon grounds, the fishing grounds are much larger than the study area.
- Overlay any one package over the fishing ground, as identified by the interviews with central coast fishermen, and highlight areas that represent MPAs that will potentially affect that fishery (i.e., prohibiting the take of that species). Calculate the total area affected.
- Then calculate the proportion of the total fishing ground that this affected area represents as well as the proportion of the fishing ground that lies within state waters and is affected.
- Value comes from implicit accounting method (bag of pennies approach, wherein interviewees are given a fictional 100 pennies, which they distribute over the fishing grounds, giving more weight to the areas they value most), Ecotrust did *not* conduct an impact analysis or an explicit accounting of value from these specific areas, based e.g. on catch. In general areas closer to shore are more highly valued by the fishermen.

Astrid showed results on the percent area of the total commercial fishing grounds that will be potentially affected by each MPA package for each of the 19 fisheries. She then showed the percent of commercial fishing grounds within the study area (rather than total fishing ground) potentially affected by each MPA package. Astrid reflected that Package 1 has a small impact on spot prawn, squid, and salmon fisheries, the fisheries that are well represented on the CCRSG.

Next she showed graphs of the percent value of total commercial fishing grounds that would be potentially affected by each MPA package. In some cases, you may affect a large area, but still have a small potential impact on value. Package 1 is particularly good at avoiding high economic costs because its proponents have internalized the information about high value areas that Ecotrust gathered in their surveys.

The final commercial slide shows the percentage of stated importance or value potentially impacted by the different packages within the study area fishing grounds.

Recreational fishing analysis methods

- Total area of recreational grounds potentially affected
- Maximum number of recreational trips affected (data are reported in microblocks, therefore a trip does not = 1 day; in one day a vessel may go to multiple microblocks, but each new block you visit represents a trip). Trips may be double-counted because a

single vessel may visit several blocks in one day and each is counted as a trip to that block.
- Data not available for all 19 species groups – only available for rockfish (1 big lumped category) and salmon
- Calculated total area of recreational fishing grounds potentially affected by MPA package in square nautical miles
- Calculated proportion of microblock potentially affected by each MPA and used that to calculate a proportional number of trips that would be potentially affected
- Calculated maximum number of recreational fishing trips potentially affected by each of packages

Discussion

There might be an intermediate distance from shore (between three miles and the maximal extent of the fishing grounds) that would be most relevant to show because it is the area of highest use and value for the fishery. However, that distance varies by fishery and is considered sensitive information by the stakeholders.

This study does not explicitly take into account existing RCAs or other fishery regulations because these are the status quo and new MPAs would not affect these. However, one should note that the interview data are smoothed over environmental variation, temporal differences in regulation, etc. because they are based on each fisherman's lifetime experience and may include periods with and without RCAs.

The species are listed alphabetically rather than ranked by landings, revenues or other order of importance. The SAT agreed that the species should be listed alphabetically rather than making a judgment call about which fisheries are most important or valuable. However, they suggested that Astrid add an introductory slide ranking species by their ex-vessel value, and then show the proportional impacts slide with species listed alphabetically.

Suggestions for presentation of this analysis

- Indicate whether these proportional impacts are large percentages of small area or vice versa (i.e., include total area of fishing grounds).
- Change title of slides on potential impacts to fishing ground "value" to "stated importance" to reflect the fact that value is not based directly on economic revenues, but on perceived importance.
- Emphasize that this is the maximum value that could be affected because catch might be made up elsewhere.
- For recreational fishing analysis, change units to statute miles instead of nautical miles; express this area potentially affected as a proportion of total area.
- Add total number of trips to the graph for both total fishing grounds and the central coast study region.

Next Steps

John Ugoretz and John Kirlin outlined the next steps in the process. The most up-to-date scientific review information will be posted in the next couple of days. Stakeholders will have a chance to revise their packages given the SAT's input. The BRTF will meet January 31 and February 1. Final versions of the packages will be assembled Tuesday, January 24. Proponents can send in reactions and changes up until then. Staff and the SAT will not be asked to review or analyze those revised packages. There will be a three week period after the BRTF meeting to do whatever they suggest in terms of additional analysis or modification of the packages. It is likely that the BRTF will emphasize staff and proponents working together during this period.

The SAT's next meeting will be in March, and the BRTF will have another meeting two weeks after that. An additional final analytic filter will be required at some point before the proposals go back to the BRTF. Latest versions of all evaluations are due by 10 a.m. on Monday the 23rd. All evaluation documents should be marked "Draft".

Final suggestions for presentations

- Figure 3 from Rick Starr's presentation – put on one page all the different packages for the same subregion to allow inter-package comparison
- Individual subregion comparisons are a second tier of detail. May only want to show them to make the point that those data are available, but focus primarily on the regional level results.
- Table 1 – would be good to add the whole region (i.e., all subregions together) as an overview.
- Need to distill the results with regard to goal 6, network function. Steve Gaines and Loo Botsford can make the point about how the packages differ in "networkedness". They will need to clearly explain how their approaches differ. When thinking about spacing using Loo's method, production outside the MPAs matters (i.e., fishing levels outside reserves will impact connectedness).
- Address whether the drop off in persistence observed in the southern part of the region is driven by habitat limitation or whether there is potential to improve network function in this part of the region.
- Be clear about which goals are being evaluated, and the fact that goal 5 is not being evaluated.
- Work in Steve Palumbi's results on replication (goal 3).
- Additional analysis of how well the packages are set up for experimental replication, controls, and monitoring could be useful but has not yet been done.
- Loo Botsford's analysis was not conducted using the most up to date versions of the packages. It should be redone or put forward as an example of the type of analysis that could be done. Staff will work with Loo to decide on how to proceed.
- List the packages in the same order in all presentations: package 1 at top of graph, AC at the bottom.

- Aim for as much accuracy and consistency as possible among the presentations. Hopefully we can combine them into a single integrated presentation.
- If SAT will give us license, staff would like to construct an integrated decision framework for the BRTF based on these analyses.

Identification for the BRTF of High Level Difference in MPA Packages

Steve Barrager led a discussion designed to draw out the high level insights that have been gleaned in the evaluation so far. Steve asked the group members what they have learned that is going to help the BRTF with its decisions. What are the relative strengths and weaknesses of the different packages; where are there areas for improvement? For the presentation, the SAT should state these insights and then provide the evidence that supports each insight. The following is a list of insights generated by the SAT, going around the room and each adding observations and insights until there were no new comments. The SAT members then voted on those insights that they thought were most important. Each member had 11 votes to cast.

1. All of the packages seem to show a significant improvement compared to the default (package 0) in their conservation value. **5**
2. In terms of ecological protection, Package 1 tends to offer the least protection in terms of size and spacing; Package 2 offers the most. **4**
3. We've shown how well the proposed configurations perform for the persistence of populations. **2 (keep)**
4. All the packages appear to meet the MPF guidelines, which appear to exceed the MLPA requirements. **1 (contrary to another insight listed above, needs to be investigated)**
5. All of these packages tend to increase conservation value over the status quo, but differ in how well they protect the various habitats within the study region. **7**
6. Packages 2 and AC appear to protect similar amounts of habitat at a high level. Packages 1 and 3 provide lesser amounts of high level protection. **9**
7. Package 1 protects the least amount of both shallow and deep rocky habitat. Other three packages protect similar amounts of rocky habitat, and more than Package 1. **3**
8. For meeting goals 1, 2, 4 and 6, packages 0 and 1 are deficient based on size, protection level and likelihood for population persistence. **8**
9. Based on the improvements between October and January, significant improvements and win-win situations could be achieved with more data and interpretation. **5**
10. Based on recreational fishing data, proposals differ significantly more in terms of restrictions on commercial fishing than on recreational fishing. Effects on recreational fishers are similar across all packages, while there are greater differences in the impacts on commercial fisheries among packages. **6**
11. Half or more of all MPAs within the packages were too small based on our guidelines. (50-87%) **6**

12. Packages 2, 3 and AC each have several MPAs which individually contribute to significantly greater impacts to one or two commercial fisheries or moderate impact to a greater number of commercial fisheries, compared to Package 1. **2 (keep)**
13. Via small changes in boundaries or changes in activities, protection levels could be increased. **5**
14. In general, network function seems to be stronger in the north than the south across all packages. **4**
15. There is a lot of uncertainty in the underlying data and the modeling and assessments we have made. I would encourage the BRTF to ask questions. **3**
16. With more time we could describe the potential impact of existing uncertainties in a better way. **3**
17. Given the differences in the packages, the similarities are surprising. Differences seem to be in level of protection and economic impact by area and community. **5**
18. All packages included many MPAs smaller than that recommended by the SAT. Nonetheless the packages still differ in the number of MPAs that are too small, so this should be taken into account in comparing them. **2 (already included in another statement)**
19. From a biological perspective, the SAT is focused on the high levels of protection to meet the goals and underemphasized the value provided by MPAs with lower protection levels. **3**
20. For goal 3, all the packages meet or come close to meeting the replication criterion, with the possible exception of deeper water habitat. **4**
21. From a socioeconomic perspective, we focused on the maximum effects on recreational and commercial fishermen and ignored any effects on nonconsumptive users. **7**
22. We haven't paid attention to why we have SMCAs in the first place. We have not considered inter-species or interactivity effects of SMCAs.
23. We have explicitly had to define what we mean by level of protection within the evaluation process. **3**
24. All the packages have many MPAs that meet or are closer together than minimum SAT guideline for spacing. **3**
25. In some geographies user group needs/interests outweigh the ecological values (e.g. Monterey waterfront). **0**
26. Package 1 appeared to have a lesser impact on commercial fisheries than the other three packages. **0**
27. All packages do well with regard to spacing of high protection MPAs in shallow, but not deeper habitats (but like the northern/southern comparison, habitat availability needs to be considered for this conclusion). **2 (keep)**
28. The analysis of persistence is an ecologically more comprehensive way of assessing population protection than individual guidelines. **3**
29. DELETED – redundant
30. Each of the packages represents a thoughtful analysis and a potential solution to the problems posed by the MLPA. **4**

31. The experience of this round of evaluations and analyses is suggestive of tools and analyses that would be helpful in other regions. **1 (keep)**
32. All of the packages did a good job minimizing impacts on recreational fishing and as a consequence, commercial fishing bears the brunt of impacts in areas of high protection. **3**
33. Differences between packages 2, 3 and AC are smaller than the differences between Package 1 and these other three. **4**

The SAT re-reviewed the list to see if any of those which got a small number of votes could be eliminated. The only ones to be removed are the few that no one voted for. Staff will try to lump some of these points and prioritize them according to the voting. The list could be parsed into (a) hypotheses that need further investigation, (b) lessons learned, and (c) practical advice for BRTF decision-making. It will be circulated to the SAT on Monday.

This table of insights will be presented to the BRTF as a complement to the more detailed presentation of the SAT's evaluation. It is a more qualitative summary of the quantitative results, and should reflect their best professional judgment. High priority insights identified here will then have to be backed up by evidence from the evaluations.

Other Evaluation Materials

Mark Carr asked what the status of the Bren School students' analysis of the packages was and what the staff's impression of their efforts was. John Kirlin responded that Bren School students, under the direction of Satie Airame, have been conducting a MARXAN analysis of ecological and socioeconomic values of the different packages. John indicated that it will be difficult to bring the Bren School analysis into the process now because of differences in spatial resolution (microblock for their analysis), etc. It may be useful as proponents move forward and think about modifying their packages. MLPA Initiative staff will talk with Satie Airame about how to bring this work to the SAT and to project proponents. This will require a meeting to discuss the methods and how the results should be interpreted. We might want a one day caucus among the Bren School group, members of the SAT, and proposal proponents to introduce them to MARXAN and share and discuss the results.

Public Comments

Steve Shimek – Packages were prepared under guidance provided by John Kirlin and John Ugoretz that kelp leases would not be considered in the evaluation. The SAT evaluation should be consistent with what staff told proponents to do.

Dave Edlund – In what format will we get feedback from the SAT so that we can make revisions to our plans? Will we get specific feedback or general feedback? On the topic of SMCAs, we feel like they are the stepchild of the process and don't get enough credit. Most of focus of the SAT has been on high level protection areas, but we feel like moderate level SMCAs should count toward goals 1 and 4.

Karen Garrison – Is there any chance of getting specific feedback in a summarized way (maybe staff can summarize evaluations so far)? Statements about the relative performance of the different packages should be well qualified based on the uncertainties of the data (especially socioeconomic data).

Jesus Ruiz – We have made some changes to Package 2 which we will submit by Monday at 10 a.m.

Upcoming meetings

Thursday, March 2, 2006 in San Luis Obispo

The evaluation subteam will meet between now and March 2 to further discuss the evaluation.

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM (SAT)
DRAFT MEETING AGENDA
(Revised March 1, 2006)

Thursday, March 2, 2006
9:00 a.m. - 4:30 p.m.

San Jose State Building, Alquist Auditorium
100 Paseo de San Antonio, San Jose, CA 95113

This meeting will be videotaped; members of the public are invited to view or listen to via simultaneous webcasting on the Internet and may view an archived version approximately two days after the meeting. Please visit the MLPA website at www.dfg.ca.gov/mrd/mlpa for more information.

Meeting Objectives

- *Receive draft SAT sub-team evaluation of revised proposed central coast MPA packages and new Package S*
- *Confirm agreement on methods and results of SAT sub-team evaluation*
- *Consider and approve an executive summary for SAT evaluation*
- *Provide feedback to SAT members who will be presenting evaluations to the MLPA Blue Ribbon Task Force meeting on March 14-15*
- *Seek SAT approval of proposed changes to the MLPA Master Plan Framework to forward to the California Fish and Game Commission*

9:00 a.m. **1. Welcome, review of agenda, and recent updates**
John J. Kirlin, Executive Director, MLPA Initiative
Michael DeLapa, Central Coast Project Manager, MLPA Initiative (chair for this meeting)

9:15 a.m. **2. Presentations and discussion of evaluations of revised central coast MPA packages and new Package S**

A. Summary of packages – *Mary Gleason, Principal Planner, MLPA Initiative and John J. Kirlin*
B. Overview of how SAT evaluated packages in relation to MLPA goals – *Steve Gaines*
C. Summary of how packages address MLPA Goals 1 and 4 – *Mark Carr, Rick Starr and Mary Yoklavich*
D. Summary of how packages address MLPA Goals 2 and 6 – *Steve Gaines*
E. Ecotrust analysis of potential commercial and recreational fishery impacts of central coast MPA packages – *Astrid Scholz*

11:15 a.m. **3. Consideration of approval of draft executive summaries and conclusions of SAT sub-team evaluations**

12:30 p.m. **Lunch** – provided for SAT members and staff onsite

1:30 p.m. **4. Dry-run of presentations to the MLPA Blue Ribbon Task Force**

A. Overview of how SAT evaluated packages in relation to MLPA goals - *Steve Gaines*
B. Summary/conclusions of how packages address MLPA Goals 1 and 4 - *Mark Carr*
C. Summary/conclusions of how packages address MLPA Goals 2 and 6 - *Steve Gaines*
D. Ecotrust analysis of potential commercial and recreational fishery impacts of packages – *Astrid Scholz*

2:30 p.m. **5. Consideration of approval of suggested changes to the MLPA Master Plan Framework as proposed by peer reviewers and staff** – *Paul Reilly*

3:00 p.m. **Break**

3:15 p.m. **6. Wrap up**
Provide a clear outline of next steps to prepare for the BRTF meeting, to help ensure that the SAT presentation is educational and informative.

4:00 p.m. **7. Public Comment**
Public comment will be limited to time available at the discretion of the meeting chair.

4:30 p.m. Adjourn

CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE
MASTER PLAN SCIENCE ADVISORY TEAM
MARCH 2, 2006 MEETING SUMMARY
San Jose State Building, Alquist Auditorium
100 Paseo de San Antonio
San Jose, CA 95113

SAT members present: Loo Botsford, Mark Carr, Steve Gaines, Doyle Hanan, Jeff Paduan, Stephen Palumbi, Linwood Pendleton, Kenneth Schiff, Susan Schlosser, Astrid Scholz, Rick Starr, Mary Yoklavich

SAT members not present: Rikk Kvitek, Steven Murray, Mark Ohman, Kevin Piner, Dave Schaub, William Sydeman, Dean Wendt

Others present: Dr. Steve Barrager (SAT consultant), Rita Bunzel (MLPA staff), Michael DeLapa (MLPA staff), Evan Fox (MLPA staff), Heather Galindo (note taker; SAT support staff), John J. Kirlin (MLPA staff), Dr. Mary Gleason (MLPA staff), Paul Reilly (DFG staff), and approximately 10 members of the public

Acronyms used: California Department of Fish and Game (DFG), California Fish and Game Commission (F&GC), Marine Life Protection Act (MLPA), marine protected area (MPA), MLPA Blue Ribbon Task Force (BRTF), MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT), state marine conservation area (SMCA), state marine park (SMP), state marine reserve (SMR), state marine recreational management area (SMRMA)

Welcome, Review of Agenda, and Recent Updates

John Kirlin opened the meeting by welcoming SAT members, staff and members of the public. He reported on the BRTF's January 31-February 1 meeting, at which SAT members presented their evaluation of the proposed packages. Those evaluations continue to be very important to the BRTF and the package proponents, who have since made modifications based on SAT and BRTF feedback. The BRTF requested that MLPA Initiative staff develop a "preferred alternative," which is package S. On February 6, some package proponents met with staff and some SAT members and made revisions to packages 1, 2, and 3. Package AC has not changed.

Two issues came up in this meeting that weren't discussed at the last SAT meeting:

- The U.S. Air Force potentially objecting to MPAs off Vandenberg Air Force Base – the Office of the Secretary for the California Resources Agency and U.S. Department of Defense are having discussions about this issue.
- Kelp lease impacts on protection levels. Packages should go forward and it should be clearly defined what the impact of these leases is for each package.

John Ugoretz, MLPA policy advisor from DFG, is at a F&GC meeting today in Riverside. Paul Reilly is our DFG rep today. Later today we will be talking about changes to the SAT design guidelines in the MPF. The goals for this meeting are to understand the analyses that came out of the SAT evaluation sub-team and to make revisions to presentations; tasks will be to prepare an executive summary and to dry run the presentations that will be given to the BRTF.

That will conclude preparation activities for the March 14-15 BRTF meeting of the whole SAT. However, SAT members presenting at the BRTF meeting will be asked to gather on March 13 to conduct another practice run. At the March meeting, the BRTF will be advancing alternative packages and will also make a recommendation for a preferred alternative. Packages will then go to DFG and ultimately a recommendation will be forwarded to the F&GC.

Mike DeLapa, chair for this meeting, reviewed the meeting agenda.

Analysis of Proposed Central Coast MPA Packages and New Package S

Summary of packages

Mary Gleason gave an overview of the packages including changes since the last versions.

- Existing Central Coast MPAs
    - Package 0, no action alternative
- Internal to CCRSG
    - Packages 1-3, all revised February 9, 2006
- External to CCRSG
    - Package AC, unchanged (December 15, 2005 version)
- MLPA Staff
    - Package S, new package (February 22, 2006)

Package 0 includes 12 MPAs and one special closure and encompasses less than 4% of the study region.

Package 1 now includes 29 MPAs, representing 14.9% of the study region. The overall percentage of the region protected has decreased in this version, primarily because of the elimination of a no-trawl area. The total number and area of SMCAs has decreased, but the number and area of SMRs increased.

Package 2 was revised to try to reduce economic impacts and capture more deep water habitats. The result was a decrease in the total number of MPAs from 33 to 29 and a decrease in the percentage of the study region in MPAs from 23.9% to 19.2%.

Minor adjustments were made to Package 3, also to reduce economic impacts and capture deep habitats. This package now includes 30 MPAs (versus 31 in the December version) and encompasses 17.0% of the study region (a 0.2% decrease from the previous version).

Package AC was unchanged. It proposes 30 MPAs, which encompass 27.3% of the study region.

In late February, MLPA Initiative staff released Package S. It includes 30 MPAs (17 SMRs, 1 SMP, 11 SMCAs, and 1 SMRMA). The SMRMA is a new designation to this process that

would allow hunting of water fowl. The SMRMA is proposed for an area in South Morro Bay. The 30 MPAs would protect 17.8% of the study region.

Packages 1, 2, and 3 have converged somewhat in this latest round of revisions due to the efforts of the proponents to meet guidelines and minimize impacts according to BRTF request. However there are still differences among them, which are driven by ecological and economic tradeoffs and preferences of non-consumptive and consumptive users.

How SAT evaluated packages in relation to MLPA goals

Steve Gaines gave a brief introduction to the SAT evaluation process, explaining that the evaluations of the revised packages were conducted in the same way as previous evaluations.

How packages address MLPA goals 1 and 4

Mark Carr presented results of evaluations that he, Rick Starr and Mary Yoklavich conducted of the packages' performance with respect to goals 1 and 4 of the MLPA. Mark asked the SAT to vet the analyses this subgroup conducted, to review the SAT sub-team summary of goals 1 and 4 document, and to give feedback on their draft presentation to the BRTF.

Presentation:

- Reviewed goals 1 and 4. How well do the packages meet these goals? What are the similarities and differences across packages in meeting these goals?
- This analysis focused on three key questions:
    - How well are habitats represented?
    - How well is representation distributed across the study region?
    - What are the proposed levels of protection to these ecosystems?
- Across the study region, the effects of considering or not considering kelp harvesting are not big at all. Effects are limited to two subregions, but in those subregions the effects are rather pronounced.
- All packages (1, 2, 3, AC, S) increase protection substantially as compared to the status quo (Package 0). However they differ in levels of protection for various habitats.
- All packages provide similar amounts of moderate to high protection. Nearshore shallow habitats (estuarine, sandy beaches, rocky intertidal) receive similar amounts of moderate to high protection across packages.
- Shallow sand habitat (less than 100m depth) is the most common habitat in study region (72%). All packages provide at least moderate protection for >10% of this habitat (88 sq. miles). High protection is provided to a minimum area of 61 square miles.
- Deep sand habitat (>100m depth): Packages 1, 2, 3, and S provide moderate to high protection for 18-26%. Package AC affords moderate to high protection to 34% of deep sand.

- Differences among packages: High (SMR) protection. Packages 1 and 3 provide high protection in SMRs to15% and 16% of kelp habitat, respectively. Packages S, AC, and 2 protect 22, 25 and 28% of kelp in SMRs. This pattern tends to apply at the subregion level too, for subregions that have kelp habitat.
- Packages 2, 3, S, and AC provide moderate to high protection to 24-32% of shallow rock habitat, whereas Package 1 protects 15% of this habitat.
- Packages 2, 3, and S provide similar amounts of moderate to high protection of deep rock habitat (29-31%). Package AC provides more protection to deep habitats, at 39%, while Package 1 provides less, at 23%. Packages 1, 3, and S protect <3% of this habitat in SMRs throughout the study region. This is most notable in the Monterey Bay subregion.
- Shallow and deep canyon habitats are highly localized to particular areas within the stretch of coast from Capitola to Cape San Martin.
- Protection of shallow canyons varies remarkably between packages (4-35%). Shallow canyons are most protected by Package AC and least by Package 1.
- In Monterey Bay, packages 1 and AC protect about twice as much deep canyon habitat as the other packages (~30% vs. 15% in moderate to high protection). Package 2 protects twice as much deep canyon habitat in the subregion between Monterey Breakwater and Point Sur as the other four packages. In the subregion off the Big Sur Coast (subregion 4), packages 1, 3 and S protect 28-32% of deep canyon habitat, compared with 48-51% by packages 2 and AC.
- Matrix of habitat representation: Red means at least 10% of each habitat type exists in SMR. Dark blue is at least 10% in the SMCA high. Light blue has at least 10% in SCMA moderate. If the cell is split, then two protection types lend to 10% level.
- Regardless of kelp harvest considerations, at least 10% of each habitat type is represented at the moderate to high protection levels by all packages across the study region, with a few notable exceptions.
- Similarly, at least 15% of most habitat types in most subregions is represented at moderate to high levels by packages 2, AC and S. Package 1 does not represent shallow rock and kelp at this level across all subregions. Package 3 does not represent kelp at this level across all subregions.
- Considering kelp harvest, when 20% of the available habitat is protected at moderate to high levels, the number and types of habitats represented are much fewer, but similar for all packages across the study region. None of the packages provide this level of protection to most habitats in the San Martin to Point Estero subregion. By contrast, most habitats have 20% representation in moderate to high protection in the Point Sur to San Martin region. In general, shallow rock is much less represented in Package 1. Only Package S achieves kelp representation in most subregions at this level.
- If you disregard kelp harvest at the 20% representation level, the only changes occur in the San Martin to Point Estero subregion, where packages 2, 3 and S would now provide moderate to high levels of protection to rocky intertidal, shallow rock and kelp habitats.

- At 30% you see lots of habitats being lost, but they are lost across the packages. Packages 2, AC, and S continue to represent more habitat types than packages 1 and 3. This happens most notably for subregion 4.
- When you take kelp harvesting into consideration, the biggest impact is in two subregions (and MPAs). Off Año Nuevo there is a lease for hand harvest of kelp. If there is an SMR proposed here, it is then shifted to an SMCA moderate for level of protection. Importantly, the proposed SMRs around Año Nuevo are huge, so re-designating those as SMCAs for level of protection has a huge impact on the level of protection for that subregion. In subregion 5, the Ken Norris SMR overlaps with a kelp lease for mechanical harvesting so this would change a proposed SMR to an SMCA low. Again, there is a substantial change in the area for that level of protection for that subregion. However, across the entire study region, the greatest change is 8% for one package and 0% for other packages.

Feedback and discussion

The SAT discussed the effect of the kelp leases, particularly for Año Nuevo, where the area of kelp bed and potential harvest is very small relative to the overall size of the proposed SMR. The SAT sub-team members who conducted the analysis explained that applying a standard rule that changed the protection level of the entire MPA seemed to them to be the only fair and objective way to deal with this issue. However, they agree that the impact of kelp harvest, particularly for Año Nuevo, is likely to be small, and so changing the protection level of the whole MPA may misrepresent the actual impact.

How packages address MLPA goals 2 and 6

Steve Gaines presented results of evaluations he conducted of the packages' performance with respect to goals 2 and 6 of the MLPA, and specifically the degree to which the proposed MPAs meet the MPF guidelines for size and spacing.

Presentation:

- The packages have converged quite dramatically in terms of their size and spacing performance.
- To evaluate size, we considered all MPAs that are touching each other to be a single cluster.
- For size, we looked at both shoreline length and area (converting the SAT shoreline length guidelines into area measures).
- First, ignoring levels of protection (i.e., including all MPAs), we see that the vast majority of the MPA clusters meet SAT guidelines for length. This is a substantial change from previous versions. This analysis includes the MPAs that are within estuaries, though the maximum size of an estuarine MPA is necessarily constrained by the size of the estuary.

- Next, if there were parts of an MPA cluster with lower protection, then that portion was excluded from the area. If you only consider high protection (SMR and SMCA-high) MPAs, the vast majority of all clusters still meet the minimum length guidelines. Package proponents achieved this by dropping small MPAs and increasing the size of others.
- In the public comment period, there was concern about representing these data using proportions, so we also report the raw numbers of MPA clusters that are below, at or above the minimum shoreline length. The vast majority meet the guidelines.
- We also looked at size by comparing the area of MPA clusters to the SAT guideline (translated into area). Again, the majority of clusters meet the guidelines. Estuaries are included here, though in some cases the total size of the estuary is smaller than the SAT threshold minimum size. The expectation is that not all MPAs will meet the guidelines either because of their stated goals or because it is impossible, such as with estuaries. The SAT should consider whether estuaries should be removed from this analysis.
- When we consider just the high protection MPAs (SMR and SMCA-high), Package 1 is the only one with less than half of its MPA clusters meeting this standard. This is because Package 1 has larger MPAs with lower levels of protection.
- All of the preceding analysis was done without considering kelp leases. If we do take them into account, it doesn't make a big difference for this analysis. Generally in all packages except Package 1, one MPA is lost that was below the minimum size (Cambria SMR) and one is lost that was above the minimum guideline (Año Nuevo SMR).
- The next piece of analysis addressed the breakdown by habitat, asking: How many MPAs meeting the guidelines for size and high protection (SMRs and SMCA highs) in each package contain a significant amount of each habitat?
- When you drop some high protection MPAs because of kelp leases, the number of MPAs that represent each habitat in an adequately sized, high protection MPA drops by an average number of 1 across all habitats.
- For the 10 habitats where there is enough replication across the region to do the analysis, we examined the spacing of high protection MPAs in each of the packages relative to the SAT guideline for maximum spacing of 30-60 miles. These habitats include sandy beach, rocky intertidal, surfgrass/eelgrass, sand (0-30m), sand (30-100m), sand (>100m), kelp forest, rock (0-30m), rock (30-100m), and upwelling centers. There were substantially larger gaps in previous versions of the packages. For two habitats, rock (30-100m) and upwelling centers, the closest possible spacing, given their distributions within the region, is 90 miles, not 60.
- There is an error in the spacing summary slide: for Package 1 the third value should read 1 not 2.
- Considering kelp leases resulted in only relatively minor changes with respect to the spacing of high protection MPAs.

Feedback and discussion

There was substantial discussion about whether upwelling centers should be included in the size and spacing analysis. Package 1 exceeds the maximum spacing between upwelling centers because this package has an SMCA at Point Sur that is only in deep water and does not include the adjacent shallow waters that are most strongly affected by the Point Sur upwelling center. SAT members expressed that their original rationale for including upwelling centers as an important habitat was because of the effect of upwelling on shallow water ecosystems (<30m). Additionally, when the spacing guidelines were specified, SAT members imagined that they would be applied to MPAs that extended from the coast out to the limit of state waters. The MPF does not specifically deal with the depths at which upwelling center should be protected. Mary Yoklavich suggested that rockfish might be benefiting from upwelling effects, even in this deeper water SMCA, which starts at 50m depth. Other SAT members suggested that the primary impetus behind the spacing guidelines was to maximize the potential for exchange of individuals among similar habitats through larval dispersal. Representation of upwelling centers within the MPAs of the study region is important (though quantifying the boundaries of upwelling centers to get at total habitat area would be difficult), but spacing may be less relevant. The SAT decided to leave upwelling centers in the spacing analysis, accompanied by the caveats discussed above.

The SAT also decided to remove estuaries from the size analysis, because their small size precludes estuarine MPAs from meeting the size guidelines.

Loo Botsford's group has not had sufficient time to carry forward their analyses of network connectivity and population sustainability. Steve Gaines noted that he would make the point in his presentation that Loo's prior analyses were consistent with the ordering of packages based on Steve's size and spacing analysis. Where the packages differ is in the size distributions even as the spacing guidelines are met.

The SAT discussed how to present their evaluation results with respect to the issue of kelp leases. They agreed that the issue should be mentioned, but should not be a central focus of the presentations.

How packages address MLPA goal 3

Steve Palumbi gave an update on his analysis of the packages' relative performance in terms of replication (goal 3 emphasizes, among other things, enhancing opportunities for research). The replication results did not change much with the last round of modifications to the packages. Most of the packages meet the minimum guideline of three replicate MPAs. When you look at replication of specific habitat types, they meet this minimum very well for shallow habitats. But, they meet the guidelines barely or not at all for deeper habitats. An MPA was counted as a replicate of a particular habitat type only if it represented a significant portion of the total area (20%, 10%, or 5% depending on the rarity of the habitat). Persistent kelp patches were the only exception; these were always counted, even if there was only a small patch.

Feedback and discussion

Steve needs to redo the analysis for canyons because of a problem with how the data were coded. He will add Package AC to the analysis as well and put a line on the graphs to represent the SAT guideline.

Ecotrust analysis of potential commercial and recreational fishery impacts of packages

Astrid Scholz presented the results of Ecotrust's revised draft evaluation of potential negative impacts of the proposed MPA packages on commercial and recreational fisheries. This analysis does not compare the packages to a MPF guideline or goal as in the other analyses. The economic analysis was done for 19 fisheries for which EcoTrust collected data through interviews with fishermen.

Astrid noted that several patterns emerge from the analysis:

- Compared to the previous versions, packages 1, 2, and 3 are converging in terms of potential economic impacts: Package 1 now has 41% greater potential economic impacts, while packages 2 and 3 now have 13% and 4%, respectively, lesser potential impacts on commercial fisheries—both in terms of grounds and relative value (stated importance) in the study area;
- All packages potentiallyaffect the 19 commercial fisheries differently, with the smallest effects in terms of both value and area affected generally evidenced in Package 1;
- In the commercial fisheries, for 16 out of the 19 species investigated, Package 1 has the least effects on area and Package AC the most; packages S and 3 lie between packages 1 and 2 in 12 of the 19 fisheries;
- There are some deviations from this pattern in terms of the relative value of the affected areas, i.e., larger areas affected do not always correspond to higher stated importance;
- In the commercial fishery, for 18 out of the 19 species investigated, Package 1 has the least effects on the relative value and Package AC the most; packages S and 3 lie between 1 and 2 in 11 of the 19 fisheries;
- Package S, has the least impact on area for 2 of the fisheries, anchovy and white seabass, with comparable impacts to Package 1 for 8 of the fisheries, (anchovy, halibut, mackerel, salmon, sardine, white seabass, and squid);
- Package S, has less than 10% impact on the stated importance within the study area for 8 of the 19 commercial fisheries, compared to 12 for Package 1, 7 for Package 3, 2 for Package 2 (5 additional fisheries for Package 2 are between 10% - 11%), and 1 for Package AC.
- Packages have similar potential effects on the two recreational fisheries considered, with the package that affects the smallest area of grounds being the one that affects the least number of trips;
- Package 1, followed by Package S, affects the least amount of recreational fishing area and trips for both salmon and rockfish, with Package 2 having the largest effect on the

recreational fishing area and number of trips for salmon, while packages AC and 3 have the largest effect on the recreational fishing area and number of trips for rockfish.

Astrid and her staff are increasingly withdrawing from this process because it has become more and more politically charged. Their results will be put together by Steve Barrager and presented by Paul Reilly. There has been a push toward lumping the results and only presenting results for the "most important" fisheries. Ecotrust has turned over the data, but will not define what fisheries are important or what constitutes a significant impact, because these are fundamentally political decisions. Which years of recreational fishing data to use will also be a staff decision.

Feedback and discussion

The SAT will get a chance to see the revised presentation on potential fishery impacts before it goes to the BRTF. Staff will also circulate their revised analysis of goal 3.

The SAT noted that Elkhorn Slough, Lovers Point, Pinnacles, and Point Lobos stand out as areas of especially high recreational use. Elkhorn Slough and Point Lobos tend to be treated rather equally across packages, but there are differences among the packages in the Monterey area (especially around Lover's Point, the Breakwater and Pinnacles). Linwood Pendleton stressed that he wanted to make sure the BRTF is aware that the SAT specifically did not attempt to weight the relative strengths and weaknesses of the different configurations for the Monterey peninsula area because they felt that there was little difference among them with respect to the science-based design guidelines, and that weighing the various human uses for this area should be a policy decision.

Astrid noted that these are not hard and fast criteria and the effects are not evenly distributed. For example, while the potential effect of Package S on the spot prawn fishery is small, there would be a huge effect on the fishing grounds of one particular fisherman. How do we resolve that? Or do we leave it up to the policy makers? Future analyses of population sustainability (i.e., Loo Botsford's analysis) could shed light on the ecological benefits of MPA designs that result in particular economic impacts.

SAT members and staff discussed whether to present the analysis in terms of the proportions of the total fishing ground potentially impacted or proportions of the study region. Presenting the analysis in terms of the study region would be more comparable to the ecological analyses, while looking at the total fishing grounds might give the most accurate picture of the relative fishery impacts. One suggestion was to present the ratio of these two areas, flagging the fisheries that stand out as having particularly high or low ratios of study region area to total fishing ground area.

There was also substantial discussion about how to define the important fisheries. Potential considerations include: the proportion of the overall fishery contained within the study region, exports from the study region, and jobs supported by the fishery within the study region. In

general, SAT members were uncomfortable choosing which fisheries should be represented and were in favor of allowing the BRTF to choose which impacts are most important.

It was noted that these are first order effects, but that fishermen will change their behaviors in response to regulations, which may mitigate any impacts.

The results should be framed in terms of the policy choices the BRTF will have to make, which will be at the package level, rather than at the level of individual MPAs. Differences between packages are likely to come down to small differences. These small differences (often on politically charged topics) are likely to drive choices of which packages to forward. There was debate among SAT members about the level of resolution of information on potential fishery impacts that should be provided to the BRTF given the uncertainties and the unevenness in the data (e.g. should information on how the impact is spread among individuals be included?). It was suggested that available data be used when appropriate, but the MLPA does not require scientific data to be generated evenly across all topics.

Consideration of approval of draft executive summaries and conclusions of SAT sub-team evaluations

John Kirlin noted that updated versions of the executive summaries would be circulated after today's discussion, and staff will follow up with email and phone calls for final SAT approval.

There was much discussion about the form the SAT's feedback should take, whether it should rank the packages, and whether they should attempt an interdisciplinary analysis that looked at tradeoffs in terms of ecological benefits and economic costs. The SAT agreed that it was not appropriate for them to vote on preferred packages. They also agreed to focus the executive summaries primarily on the performance of the packages with respect to the goals of the MLPA and the CCRSG, rather than the MPF guidelines. Some members questioned whether results at the subregion level should be presented in the executive summaries.

The SAT approved the three executive summaries (goals 1 & 4, goals 2 & 6, and potential economic impacts). The SAT agreed to refer to the Ecotrust study as a fishery impacts study rather than an economic impacts study. Results for goal 3 were to be pulled out because staff produced a separate memo on goal 3.

Other suggested changes included:

- Explaining which goals were addressed and how the SAT measured performance relative to those goals at the start of each summary;
- Including a statement about water quality impacts and how they might affect MPA protection levels;
- Structuring the summaries in a way that allows easy comparison of the relative impacts of the different packages and helps to identify which packages are outliers, either positive or negative, with respect to the different goals;

- Highlighting the differences among packages and the places where each package meets or exceeds the guidelines;
- Giving the executive summaries a common structure;
- Having staff produce summaries for each package across the goals;
- Streamlining the summaries (fewer nuts and bolts);
- Including population sustainability analysis in future evaluations of size and spacing guidelines

Doyle Hanan expressed discomfort with the evaluation process because it is based on MPF design guidelines that he does not completely endorse.

Consideration of approval of suggested changes to the MLPA Master Plan Framework as proposed by peer reviewers and staff

Paul Reilly introduced suggested science-related changes to the MPF that came out of the independent peer review commissioned by DFG and the MLPA Initiative. Staff members have incorporated comments from this peer review into the document. Paul Reilly also presented proposed amendments to the document that have been suggested by the SAT evaluation sub-team aimed at explaining the levels of protection designations that were used in package evaluation. Paul asked the SAT for several references that were requested by the reviewers. There was some discussion about whether or not it was fair to revise the guidelines now, after packages have been submitted. Staff members emphasized that this is a living document and that all changes will be highlighted so that they will be clear to participants in the process moving forward.

Specific comments from SAT members on text revisions based on peer review:

- Change section 8 (Human activities ranges and MPA placement) to read, “In general, MPAs do not restrict transit.” There might be restrictions in some cases.
- Either drop or add to discussion in section 9 (Human activity patterns). The SAT recommended dropping all but the first and last sentences of the introductory paragraph.
- The description of how habitats were counted for the purpose of the spacing analysis was incorrect (section 5 under Consideration of habitats in the design of MPAs). Steve Gaines will revise.
- Check verb tense throughout. Should not be in past tense.

Additional comments from the SAT are due back to Paul Reilly by Monday.

Discussion of proposed amendments from SAT evaluation sub-team:

- Language from Ken Schiff about the effects of power plants and other impacts to water quality should be included (staff may have been working from an older version of the document before Ken’s language was incorporated).

- For future processes guidelines, replication of habitats across the study region should be incorporated in the bullet points at the bottom of page 2.
- It may not be appropriate to discuss the designations of MPA protection levels (e.g. high, moderate, low) in the MPF itself if the designations are considered an application of the guidelines.

Evaluation Summaries

The SAT evaluation sub-team presented a draft summary of the package evaluations. The document begins with text explicitly relating the guidelines and criteria used by the SAT when evaluating the MPA packages to the goals of the MLPA. In an effort to simplify the materials presented to the BRTF, the sub-team chose to focus on the matrices representing the habitats for which specific packages provide protection of 10% and 30% of available habitat of that type in the study region (assuming that habitat is distributed evenly). These percentages were calculated as follows: Taking the midpoint of the minimum MPA size guidelines (which are 3-6 miles) and the midpoint of the minimum spacing guidelines (which are 30-60 miles) provides an estimate of roughly 10% of available habitat. Similarly, taking the midpoint of the preferred MPA size guidelines (which are 6-12 miles) and the midpoint of spacing guidelines provides an estimate of 33% of available habitat. These numbers are meant to provide an estimate of the minimum and maximum area requiring protection by MPAs to meet the SAT guidelines. For a given habitat, a package may fall below the 10% guideline, meet the 10-30% range, or exceed the 30% guideline.

Using the criteria described above, the Evaluation sub-team developed a list of general comments that apply to all packages (under the scenario including existing kelp harvesting leases):

- All packages have increased conservation value over the existing MPAs.
- All packages meet the guidelines for minimum spacing for the majority of habitats (including consideration of high protection level MPAs).
    - The Point Buchon MPA in Package 3 deserves special consideration because it was misclassified by the SAT several weeks ago and therefore the package proponents are willing, but timewise were not able, to make the necessary adjustments to meet the proposed criteria.
- All packages meet the spacing guidelines.
- All packages meet at least the 10% guideline for moderate-to-high protection for all habitats.
- All packages provide moderate-to-high level protection for at least 20% of deep rock, deep sand, rocky intertidal, and estuarine habitats.
- All packages provide high level protection for at least 20% of rocky intertidal habitat.
- When 30% of the available habitat is protected at moderate-to-high protection levels, packages 2, AC and S represent more habitat types than packages 1 and 3. However, no package adequately meets this level of protection for all habitats.

- All packages provide high level protection to at least 30% of estuarine habitat.

The document will go on to evaluate if each package provides the levels of protection described above for 10% and 30% of each habitat type.

Feedback on the outline of the document included the following points:

- Use of the term "conservation value" should be avoided because "value" has a specific meaning in an economic context. "Conservation" could be replaced by relevant language that comes specifically from the MLPA.
- The following should be added to the general comments section: All packages provide protection and enhancement of non-consumptive use values in the study region.
- Verify that the language about the MLPA goals is accurate.
- In terms of presentation, the strengths of each package should be listed above weaknesses. Also, instead of using the terms "strengths" and "weaknesses" it might be more appropriate to talk about how each package doesn't meet, meets, or exceeds certain guidelines.
- The document should be structured to make presentation of habitat percentages, levels of protection, and other data more consistent throughout the document.

The revised document will be distributed to the SAT via email and final comments are due by Monday.

Wrap up

Michael DeLapa outlined the next steps for the SAT as being to review and edit final drafts of the executive summary and additional summaries focused on MLPA goals 1 and 4, goals 2 and 6, fisheries, and non-consumptive uses. In addition, MLPA Initiative staff will work with SAT members on March 13 to refine presentations for the March 14-15, 2006 BRTF meeting.

John Kirlin followed up by inviting all SAT members to attend the March 14-15, 2006 BRTF meeting. Agenda items for this meeting include presentations by the SAT evaluation sub-team, review of the adaptive management, monitoring, and evaluation document (led by Tegan Hoffmann), review of the management plan document, and the beginning of a discussion of other things that can be done to support implementation of the MLPA.

Future meetings include a joint meeting with the BRTF and California Fish and Game Commission on May 25, 2006 at which DFG will present its preferred alternative. A SAT member recommended that a few representatives of the SAT be invited to the meeting to explain the approaches the SAT took during the evaluations. An additional BRTF meeting will likely take place in early August 2006 with a focus on formally reviewing lessons learned during the central coast planning process.

Public Comment

One individual offered comment on the fact that much of the discussion throughout the meeting focused on the similarities between the packages, despite the significant differences between them. The speaker urged the SAT to let the differences show through when summarizing its evaluation of the packages. Additionally, lumping marine reserves and SMCAs with high protection may be useful, but can hide some of the benefits that can only come from marine reserves (e.g. pelagics, forage, and bait fish remain in the water; disturbance, bycatch, and uncertainty about the potential effects of fishing are all reduced).

Upcoming meetings

The next SAT meeting is scheduled for May 1, 2006 in San Jose and will focus on supporting DFG in its work on the packages and materials that will ultimately be forwarded to the F&GC.

Action Items

- Send comments on text revisions to the MPF design guidelines to Paul Reilly by Friday via email. A revised version will be sent to the SAT over the weekend.
    - Revisions by Steve Gaines for item #5 on page 11
    - Paul Reilly will revise all text to avoid using the past tense
- Send comments on amendments to the MPF design guidelines to Paul Reilly by Friday via email. A revised version will be sent to the SAT.
    - Revisions on the SMR section to be made by Mark, Rick S., and Mary.
- The evaluation sub-team will work with staff to create executive summaries and a combined executive summary and circulate to the SAT for review.